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BLISTER RUST
CONTROL WORK
in the
EASTERN STATES

1944

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WHITE PINE BLISTER RUST CONTROL IN NORTHEASTERN REGION

ANNUAL REPORT FOR 1944

United States Department of Agriculture
Bureau of Entomology and Plant Quarantine
Division of Plant Disease Control
Blister Rust Control
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Cambridge 39, Massachusetts

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ACTIVITIES AND ACCOMPLISHMENTS IN NORTHEASTERN REGION DURING 1944

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WHITE PINE BLISTER RUST CONTROL IN NORTHEASTERN REGION

ANNUAL REPORT FOR 1944

FOREWORD

This report summarizes blister rust control accomplishments during the calendar year 1944 in the Northeastern Region on the basis of the uniform financial and work projects which were adopted by the Bureau in 1942.

Part I of the report is a general statement indicating the importance of white pine in the region, distribution and spread of the rust, control accomplishments during 1944 on the basis of regional totals, and a concise summary with charts showing the present status of various phases of the control program.

Under Work Project BLR-1-1, the Bureau is responsible for leadership, coordination and technical direction of all white pine blister rust control activities in the Northeastern States, while Work Project BLR-3-1 includes all cooperative blister rust control work on state and privately-owned lands in the region. Activities and accomplishments under these two work projects are outlined in Parts II and III, respectively, of this report.

Control activities on national forests and parks, involving Financial Projects BLR-4 and BLR-5, are summarized in Parts IV and V.

The Appendix includes statistical summaries of accomplishments during the current year and accumulative results for the period 1913-1944, inclusive, and detailed information on the status of various phases of control work such as ribes eradication, control area mapping, nursery sanitation and Ribes nigrum elimination.

GENERAL STATEMENT

Importance of White Pine in The Region

The economic importance of white pine continues to be emphasized as a result of the stupendous demand for white pine lumber in connection with the war effort. Figures compiled by the War Production Board for 1943 show a nation-wide production of 1,009,466 M. board feet of eastern white pine lumber as compared with 790,651 M. board feet in 1940, a comparative increase of 27.7%. Due to the exigencies of the shipping situation, a large percentage (99.1) of the total production in 1943 was used for boxing and crating. This use pattern is not truly representative of the economic significance of the species because in normal times much of the lumber would be suited to higher types of uses.

The extent to which pine owners in the Northeastern States are responding to the all-out lumber production effort is reflected in the figures for the total cut for 1942 as compiled by the Bureau of The Census, U. S. Department of Commerce. In that year, the total cut in the nine Northeastern States amounted to 777,550 M. board feet. This constituted 71.8% of the total production of eastern white pine and 42.8% of all white pine lumber produced in the United States that year. On the basis of average stumpage and log prices in the several states, the total stumpage value of the cut in the Northeastern Region is estimated at \$4,733,834 and the total value on the basis of log prices amounted to \$13,582,194. Based on average prices at the mill, the white pine lumber produced in the Northeastern Region during 1942 had a total value of \$23,258,617.

Heavy cutting of white pine continued during 1944 but data are not available at this time on the total production. Reports from all states indicate a creditable response to the urge of the War Production Board for the cutting of merchantable white pine. Areas which escaped the devastation of the 1938 hurricane are now being logged to meet the increased demands. In this connection, efforts are being made by representatives of federal and state forestry agencies to avoid practices that will jeopardize the immature trees that are so important to a permanent lumber supply.

Blister rust control is an integral part of the protective measures that are imperative to the preservation of white pine as an all-important natural resource of the region. The heavy cutting during recent years merely emphasizes the importance of adequately protecting the remaining supply, especially the young growth which is most seriously damaged by blister rust. Under the present program in the Northeast, control is being practiced on a permanent control area of 12,607,503 acres involving 4,229,655 acres of white pine. This pine acreage comprises stands of adequate vigor which meet stocking requirements based upon an expectancy of at least 50 crop trees per acre at maturity. In addition, thousands of acres of merchantable white pine have been discontinued from the control area because little pine reproduction was present or expected on these areas and appreciable damage from blister rust should not occur prior to logging. There are also several hundred thousand acres of white pine which have been eliminated from the control area due to insufficient pine stocking, poor quality, excessive cost of control, too much infection, or because the total amount of pine in a township was not sufficient to justify public expenditures for control work.

The botanical range of white pine includes the entire Northeastern Region but there are relatively large sections, especially in northern and eastern Maine, the northwestern portion of New York, most of New Jersey, and several counties in the southeastern and western parts of Pennsylvania, which are not included in the blister rust control area (see map on Page 7) chiefly because of the scattered distribution of white pine. It is estimated that the total white pine forests in this region (pure stands and mixed stands containing 20-79% white pine) comprise approximately five and a quarter million acres. Over 99 percent of this pine is in state and private ownership, chiefly farm wood lots.

Eastern white pine is also very important from a scenic and recreational viewpoint, as it adds immeasurably to the attractiveness of the region. Before the war, the value of the tourist business in New England alone was estimated at 400 million dollars per year. In addition, white pine has a high value for watershed protection and has been planted extensively for that purpose as well as commercial reforestation.

Blister Rust Infection on Pine

Blister rust infection has been reported on white pine throughout the region, except in 16 Pennsylvania counties, five non-pine counties in New Jersey, and four New York counties, the latter comprising the metropolitan area of New York City. Over extensive areas from 1 to 20 percent of the pines are infected; and in numerous local tracts, from 30 to 90 percent of the trees are diseased, many in a dead or dying condition. The amount of infection varies considerably in different localities and is influenced by the number of original infection centers caused by the planting of imported diseased pine, the distribution and amount of pine, association of pine and ribes, climatic conditions, and the application of control measures. Pine infection is most severe in Essex and Warren Counties in New York, the upper Connecticut River Valley region in New Hampshire and Vermont, and in most sections of Maine, outside of Cumberland and York Counties. In these portions of the Northeastern Region damage to commercial size trees is very noticeable and lumbermen are now commenting on the number of broken-off tops, dead and dying trees. In southern New England and in most of the southern and western portions of New York, pine infection is relatively light, except in limited areas. Due to fewer plantations of imported diseased stock and the localization of native white pine areas, there has been a relatively slow spread of blister rust infection in New Jersey and Pennsylvania. However, in the latter state, numerous large ribes are encountered in many sections and in unprotected areas a rapid intensification of the disease results once it becomes established.

Recent pine infections are very scarce in areas where ribes eradication work has been performed; whereas during the early years of the control program, young pine cankers could be found in more or less abundance in nearly every pine area. Present conditions are the direct result of ribes eradication work and demonstrate the effectiveness of control work in protecting the white pine forests. In unprotected areas, the disease continues to increase, varying locally according to conditions.

Blister Rust Infection During 1944

The extremely dry weather which prevailed throughout the region during May and the early part of June was apparently unfavorable for the development of infection on ribes. It was not until about the middle of August that ribes became generally infected. In some districts heavy infection on ribes was reported after that date.

Blister rust has been generally distributed on white pine in this region for many years, but there are several counties outside the control area in New York, New Jersey and Pennsylvania where there is no record of the disease being found on pine. No scouting work has been performed in these counties for several years.

A few additional centers of old pine infection were located during the course of the 1944 field work. Many of the leaders also reported the finding of young cankers (1941 and 1942 origin) chiefly in unprotected areas and tracts where control work was performed several years ago. However, no extensive areas with such young pine infections were located during the current year. Unfavorable weather during the critical period from July to September in recent years was probably the chief factor in limiting the amount of new pine infections. Another important factor is the application of protection measures on approximately 86% of the control area.

Policy For Control Activities During War and Plans For Post-War Program

Blister rust control activities in this region have been adjusted to meet war conditions. A holding program has been adopted for the duration of the war, the chief objective being to maintain control on as many of the protected areas as possible with the limited manpower available. Labor employed on the control projects has consisted chiefly of high school boys and men above the draft age or with slight physical handicaps. In recruiting labor every effort has been made not to hire persons who were needed on agricultural work or in war industries. Travel has been restricted and purchases of equipment and supplies limited to bare essentials. Thorough planning of each activity in advance has been paramount to assure effective results. Some of the permanent personnel have been temporarily detailed to aid the Timber Production War Project and assistance has been given other war projects wherever practicable.

The states and local cooperators have continued to give excellent support to the control program during the war period and in several instances there has been an increase in such cooperative funds. A total of 1,271,441 acres have been cleared of ribes during the past three seasons, or an average of 423,814 acres per year. This is a very commendable accomplishment under existing conditions.

Detailed plans have been prepared covering a proposed program for blister rust control in the Northeastern Region during a five year period immediately following the war. Under this plan, all necessary control area mapping work would be completed during the first three years. The proposed ribes eradication activities during the five year period would complete all remaining first and any necessary second work. This would necessitate working an average of approximately 1,630,000 acres per year which is about 100,000 acres less than the acreage examined in

this region during 1936 which was the peak production year under the Emergency Programs. Upon completion of the proposed five year post-war program, the bulk of the control area would be on a maintenance basis and it will be possible to reorganize the program in accordance with future needs.

Control Activities During 1944

All blister rust control activities in the Northeastern Region during 1944 were conducted under the Regular Cooperative Program, and all of the work was on state and privately-owned lands with the exception of small projects at Acadia National Park in Maine and on the White Mountain National Forest in New Hampshire and Maine which were operated in cooperation with the National Park Service and the U. S. Forest Service.

In spite of war time conditions, 414,100 acres were cleared of 2,491,161 wild and cultivated currant and gooseberry bushes as a result of 29,423 man days labor during 1944. Compared with the previous year, there were increases of 12.3% in acreage cleared of ribes and 7.3% in man days employment, but a decrease of 3.2% in number of ribes destroyed.

The environs of 14 nurseries in four states were also examined for ribes during 1944. Only 637 wild and cultivated bushes were located and destroyed in the sanitation zones comprising 7,390 acres. There were 52,126,000 white pines in the nurseries protected during the current year.

Due to the advisability of conserving funds for ribes eradication work, only a few laborers were employed on control area mapping work in 1944. Several of the district blister rust control leaders, however, performed such work during the fall and winter months. A total of 64,939 acres was mapped in detail in five states, about 46% of this acreage being mapped by the district leaders.

Blister rust, canker elimination work in 1944 was restricted to New York State where a few laborers were used to remove infections on white pines in county-owned plantations and from ornamental trees in the state reservation at Saratoga Springs. A total of 14,900 white pines were examined and 360 fatally infected trees cut down. In addition, 372 branch and stem cankers were removed from 41 other infected pines.

No special black currant elimination work was performed in 1944, but such cultivated bushes were removed in conjunction with the regular ribes eradication projects in all states.

Status of Control Area Mapping

The Emergency Programs during the period 1933-1942 were of great assistance in providing men to make detail maps of blister rust control areas which are essential in planning and executing control activities. However, only a limited amount of pre-eradication survey work has been possible under the Regular Cooperative Program as funds have not been available to hire temporary employees for such activities and the permanent personnel have to spend most of their time during the fall and winter months on informational and service activities to secure local cooperation in applying control measures.

The present net control area in the Northeastern Region comprises 12,607,503 acres, of which 8,375,863 acres, or 66.4%, has been detail mapped. Such mapping work has been completed in Connecticut and is 96.3% complete in Vermont. The unmapped acreage in the control area aggregates 4,231,640 acres of which 61.7%, or 2,609,208 acres, are in the States of New Hampshire and Massachusetts. Many of the areas which have not been detailed mapped in this region were initially cleared of ribes prior to 1933 at which time spot maps were prepared, usually on U.S.G.S. sheets, to show the location of the white pine types and the boundaries of the control areas.

The 1938 hurricane and the extensive cutting of white pine since 1941, in connection with the production of lumber for industry and war uses, have changed the status of many of the blister rust control areas. The 1944 hurricane also affected many areas in southeastern Massachusetts. Consequently most of the detail maps prepared prior to 1938 are now more or less obsolete and it will be necessary to revise them as soon as funds and personnel are available for such activities. It is now possible to determine whether the areas affected by the 1938 hurricane have restocked to white pine, but in the case of recent cuttings reliable information as to pine regeneration cannot be obtained for at least three years after the cuttings occurred. However, the district leaders have been instructed to locate any cut-over areas on their maps and make plans to re-examine these units at a later date to determine whether they should remain in the control area or be discontinued. It is also planned to use aerial photographs as far as possible on future control area mapping work in this region.




Chart No. I shows the percentage of the present net control area that has been detail mapped in each county in the Northeastern Region. In many of the Pennsylvania counties shown as partly completed, most of the white pine areas have been mapped in detail, but not the protection zones.

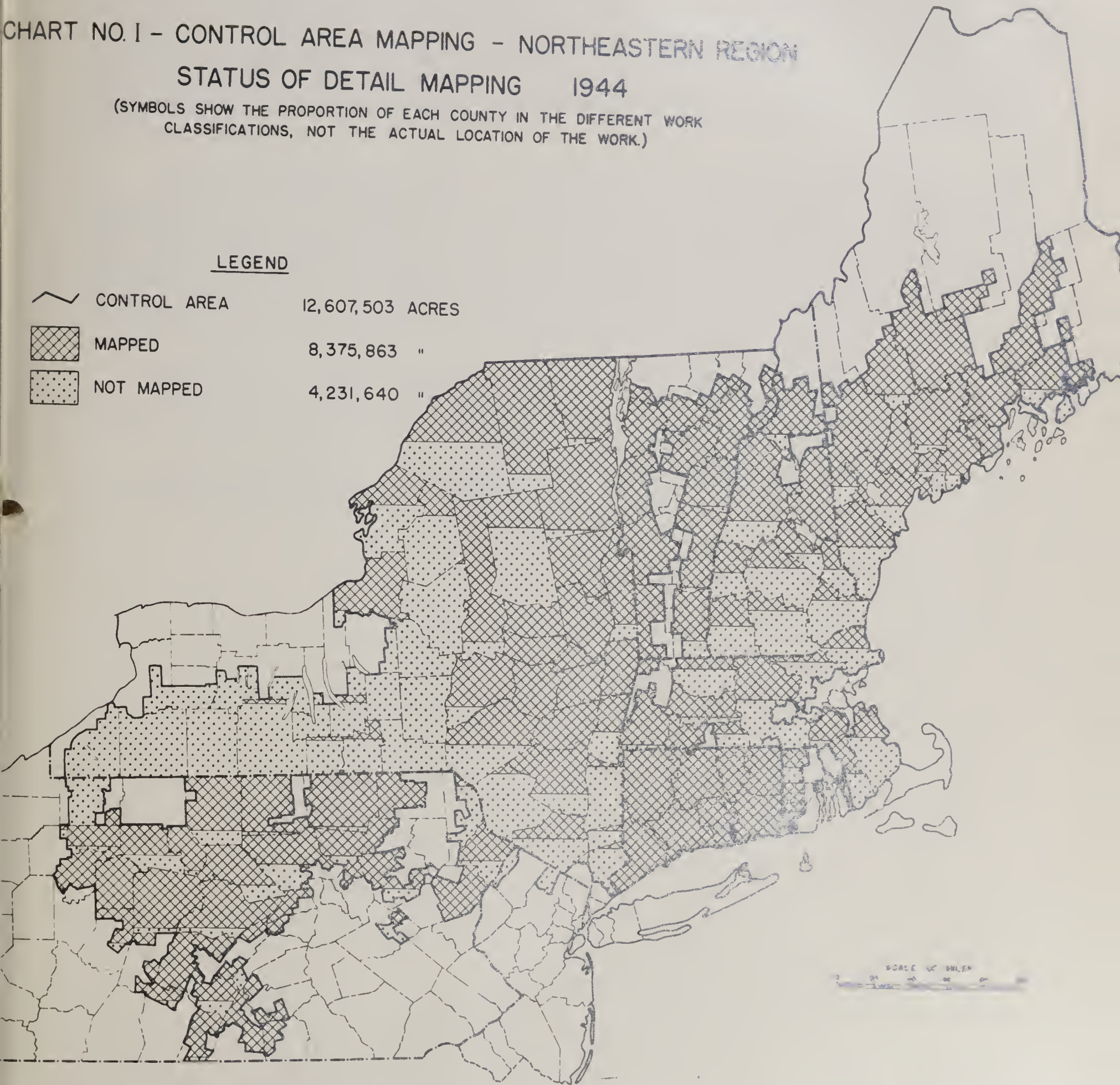
CHART NO. I - CONTROL AREA MAPPING - NORTHEASTERN REGION

STATUS OF DETAIL MAPPING 1944

(SYMBOLS SHOW THE PROPORTION OF EACH COUNTY IN THE DIFFERENT WORK CLASSIFICATIONS, NOT THE ACTUAL LOCATION OF THE WORK.)

LEGEND

	CONTROL AREA	12,607,503 ACRES
	MAPPED	8,375,863 "
	NOT MAPPED	4,231,640 "



SCALE OF MILES
0 25 50 75 100

Status of Ribes Eradication Work

The present net control area in the Northeastern Region comprises 12,607,503 acres of which 10,833,945 acres, or 85.9%, has been given initial protection. Second work has been performed on 4,413,863 acres, or 35.0% of the net control area. In addition, 566,956 acres have been worked three times. At the end of 1944, a total of 2,618,534 acres, or 20.8% of the net control area, was classified as being on maintenance since the ribes in these tracts are so scarce that danger from blister rust is negligible for an indefinite period. Several hundred thousand additional acres undoubtedly could be placed on maintenance, but in most instances field inspections will be necessary before such action can be taken and plans are being made accordingly.

At the present time there are 5,969,472 acres, or 47.3% of the net control area, which should be examined to determine the need for rework. The 1938 and 1944 hurricanes in New England and the extensive cutting in all parts of the region since 1941 have affected the blister rust control status in many areas and field examinations will be necessary to obtain information on pine and ribes regrowth. It is expected that rework will be necessary in many of these tracts, where control measures were applied in past years, due to the regrowth of ribes.




Charts II and III show the status of the initial and second ribes eradication work in the region by counties, while Chart IV depicts the percentage of the net control area in each county that is now on a maintenance basis.

Tables 36 and 37 in the Appendix list detailed information on the status of control work by districts, states and land ownership classes.

CHART NO. II - RIBES ERADICATION - NORTHEASTERN REGION
STATUS OF FIRST WORKING 1944

(SYMBOLS SHOW THE PROPORTION OF EACH COUNTY IN THE DIFFERENT WORK CLASSIFICATIONS, NOT THE ACTUAL LOCATION OF THE WORK.)

LEGEND

	CONTROL AREA	12,607,503 ACRES
	WORKED	10,833,945 "
	NOT WORKED	1,773,558 "

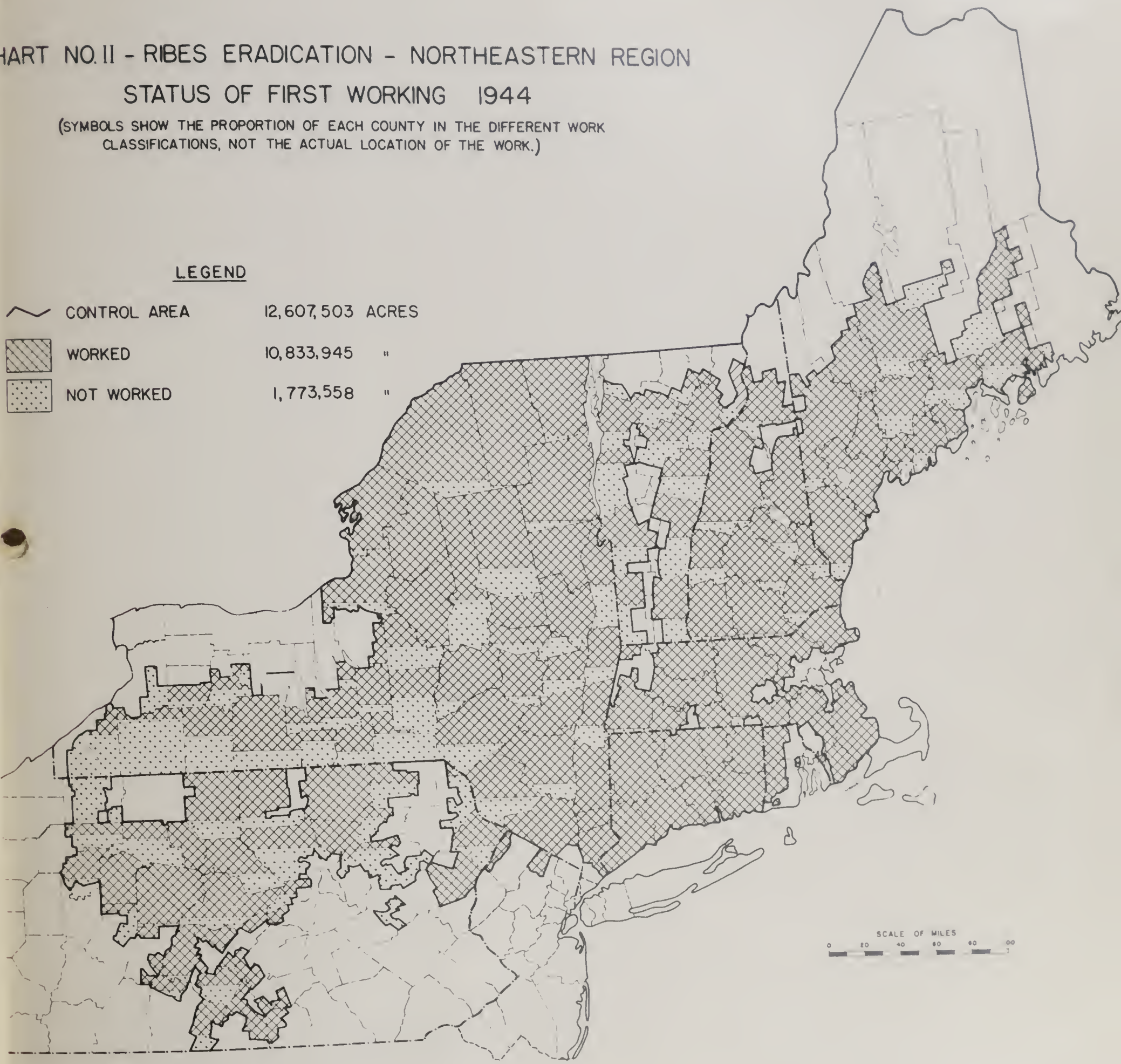





CHART NO. III - RIBES ERADICATION - NORTHEASTERN REGION

STATUS OF SECOND WORKING 1944

(SYMBOLS SHOW THE PROPORTION OF EACH COUNTY IN THE DIFFERENT WORK CLASSIFICATIONS, NOT THE ACTUAL LOCATION OF THE WORK.)

LEGEND

	CONTROL AREA	12,607,503	ACRES
	WORKED	4,413,863	"
	NOT WORKED	8,193,640	"

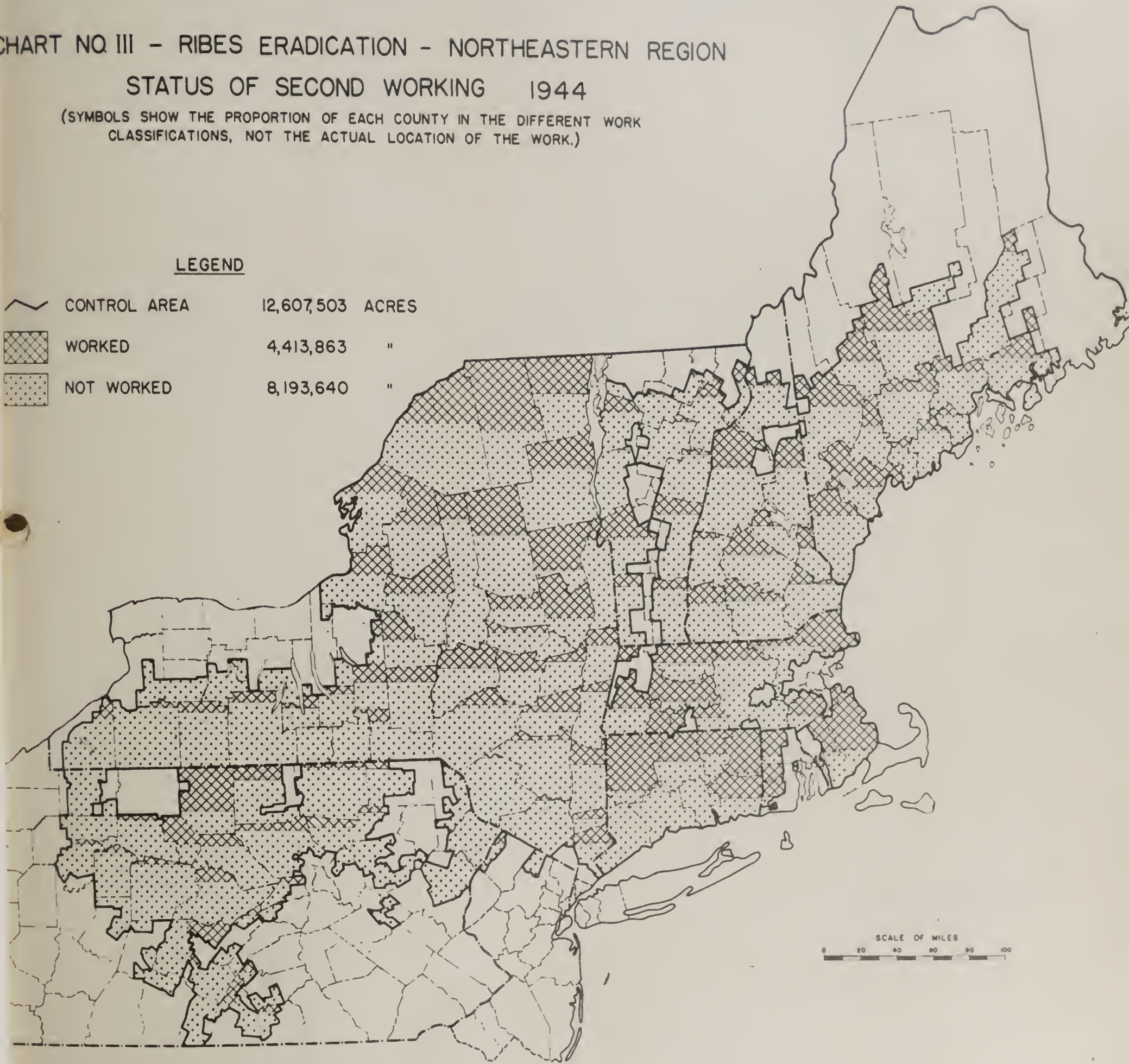





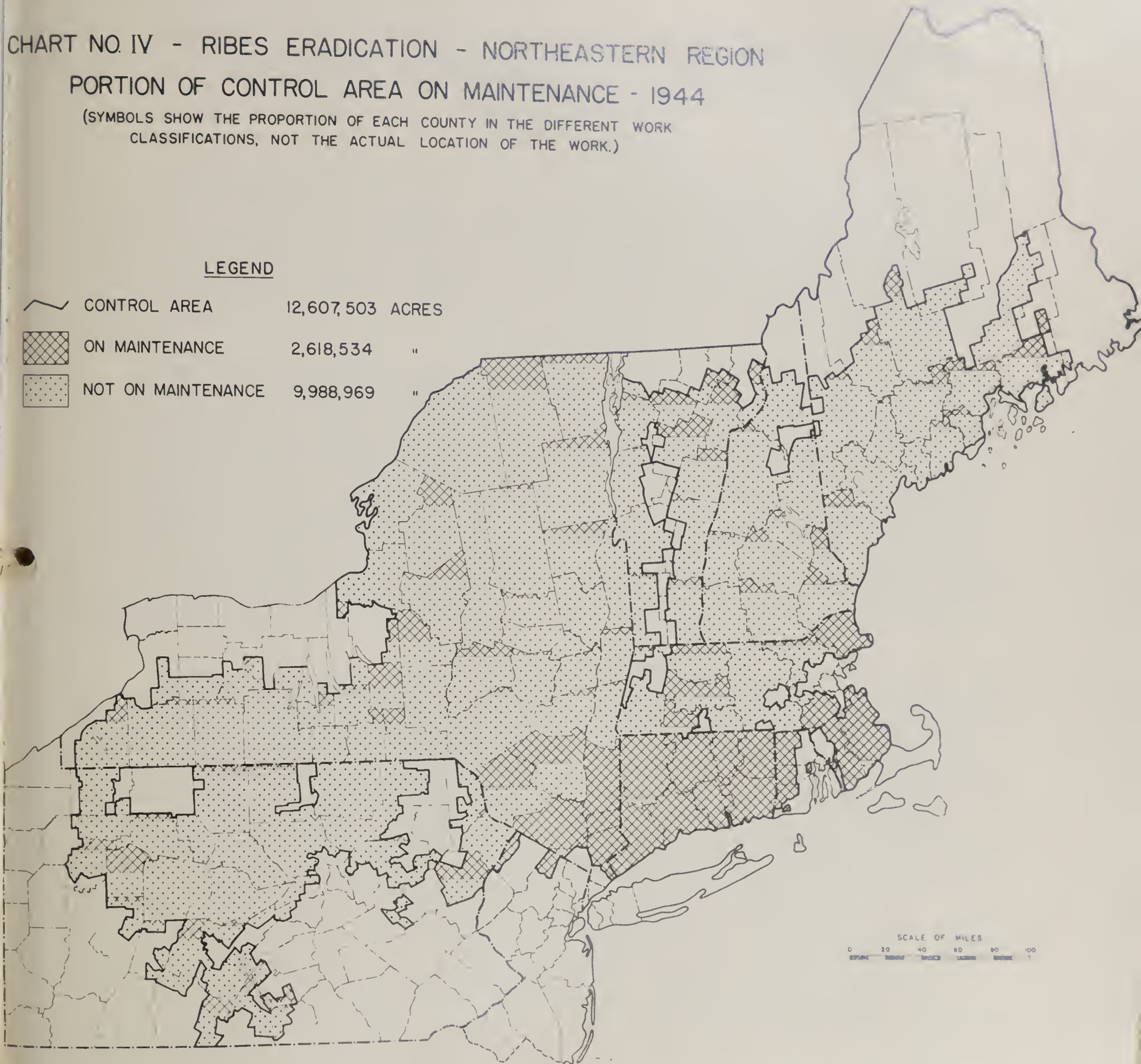
CHART NO. IV - RIBES ERADICATION - NORTHEASTERN REGION

PORTION OF CONTROL AREA ON MAINTENANCE - 1944

(SYMBOLS SHOW THE PROPORTION OF EACH COUNTY IN THE DIFFERENT WORK CLASSIFICATIONS, NOT THE ACTUAL LOCATION OF THE WORK.)

LEGEND

	CONTROL AREA	12,607,503 ACRES
	ON MAINTENANCE	2,618,534 "
	NOT ON MAINTENANCE	9,988,969 "



PART II

LEADERSHIP, COORDINATION AND TECHNICAL DIRECTION OF WHITE PINE BLISTER
RUST CONTROL IN NORTHEASTERN REGION - WORK PROJECT BLR-1-1

GENERAL STATEMENT

Under Work Project BLR-1-1, the Bureau of Entomology and Plant Quarantine is responsible for the leadership, coordination and technical direction of all blister rust control activities in the Northeastern Region, which comprises New York, New Jersey, Pennsylvania, and the six New England States. However, no control work has been performed in New Jersey since 1937 as all important white pine areas in that state have been given protection and are now on a maintenance basis.

Other federal agencies participating in the control program in this region are the Forest Service and the National Park Service. These agencies are allotted funds for control work under the Agricultural Appropriation Act, and are responsible for the disbursement of such funds, employment of personnel, and selection of control areas. In this work the Bureau of Entomology and Plant Quarantine is responsible for the preparation of plans, training of field personnel, checking the control work to assure effective results, keeping adequate maps and records, and making reports of the results of control activities. Projects on federal lands in this region during 1944 were restricted to Acadia National Park in Maine and the White Mountain National Forest in New Hampshire and Maine. Detailed information on the results of such activities are given in Parts IV and V of this report.

Cooperative control work on state and privately-owned lands in each of the Northeastern States is conducted under a memorandum of Understanding between the Bureau of Entomology and Plant Quarantine and the authorized state regulatory agency - usually the state forestry department. Under each of these agreements, the Bureau furnishes the services of a state blister rust control leader and such district leaders as may be agreed upon from time to time in accordance with the needs of the work and the availability of funds. These leaders give direct supervision to all control activities in their respective districts. The cooperating states furnish the services of a responsible state employee (usually state forester) who has nominal charge of the cooperative program and is responsible for all matters concerned with carrying out any state laws and policies with respect to blister rust control. The states also cooperate with counties, towns, associations and individuals in the local eradication of ribes; furnish the necessary office space and facilities at state headquarters for the direction of the cooperative work; and enforce state laws for the effective prosecution of blister rust control work, including regulation of the intrastate movement of blister rust host plants.

Under the cooperative agreement in New Hampshire, the five district blister rust control leaders also act as district forest fire wardens and spend about one fourth of their total time on such activities, the cost of which is paid from forest fire control funds. A similar arrangement prevails in Vermont, where the three district leaders spend one quarter of their total time on informational and service work in connection with fire protection and other general forestry activities.

The blister rust control responsibilities of the Bureau of Entomology and Plant Quarantine in the Northeastern States are administered by the regional office of the Division of Plant Disease Control located at Cambridge, Mass. This office provides the over-all planning and coordinates into a uniform program the different phases of control work performed in cooperation with state and federal agencies; budgets federal funds for field work; inspects field activities to make sure effective results are accomplished; conducts special field surveys; furnishes the blister rust control leaders and cooperative employees with subject matter and technical information essential to the proper conduct of their work; summarizes and analyzes records of accomplishments; makes purchases of supplies, materials and equipment; processes all payrolls and accounts paid from federal funds; and prepares special records, periodical and annual reports.

The Division of Domestic Plant Quarantine of the Bureau of Entomology and Plant Quarantine is responsible for the enforcement of federal regulations on the interstate movement of blister rust host plants.

Personnel

At the end of 1944, the permanent personnel of the Division of Plant Disease Control in the Northeastern States consisted of seven regional office employees, six state leaders, and 22 district leaders. In addition, one leader is employed full-time in Rhode Island, the state and Federal Government paying his salary alternately for six month periods. Dr. Rusden, who has had charge of all blister rust control investigational work in the three eastern regions, since June 1, 1944, is also headquartered at the Cambridge, Mass., regional office.

The following personnel changes occurred during the calendar year 1944:

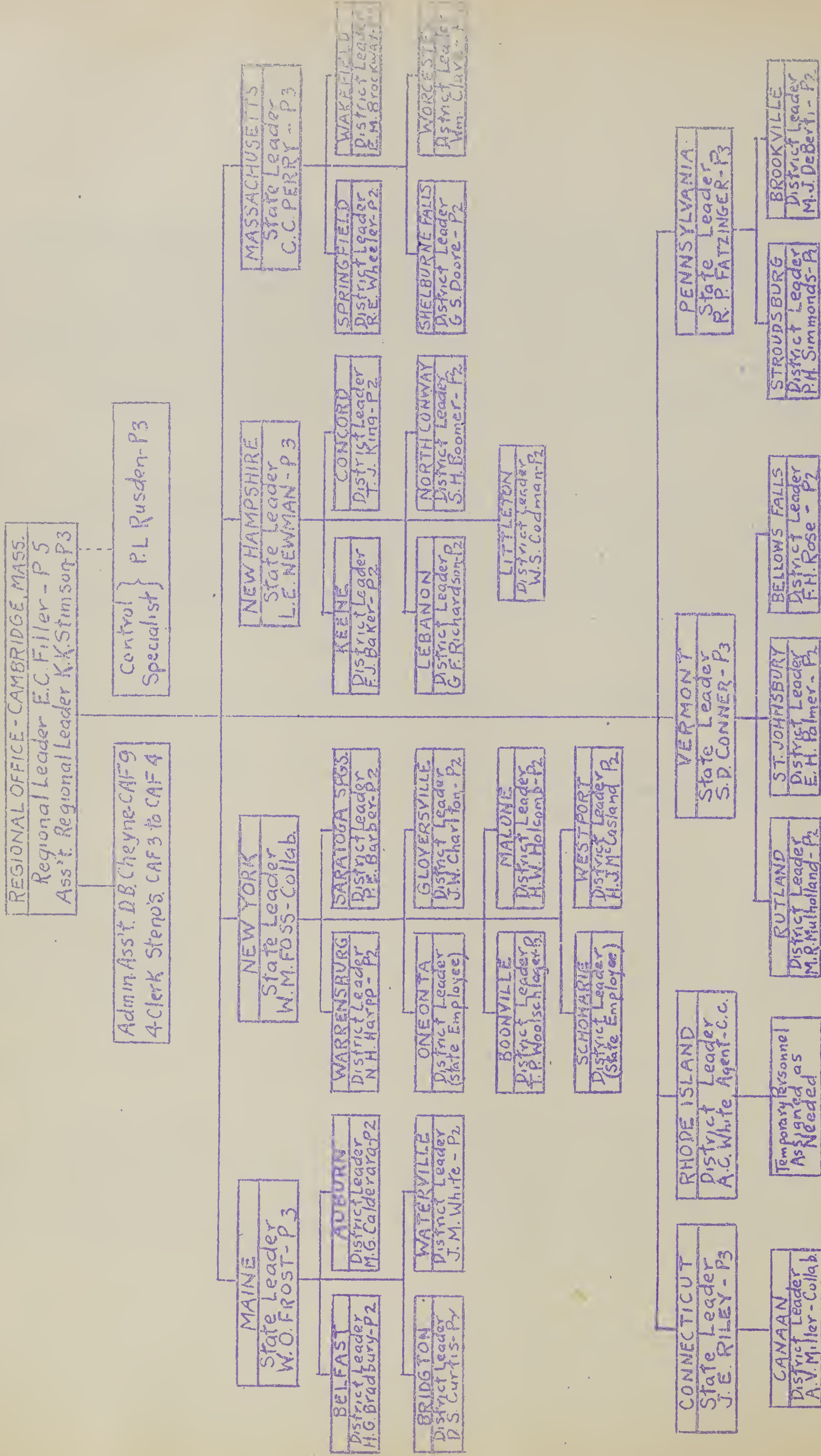
District Leader White, of Maine, resigned on October 31, 1944 but his terminal leave does not expire until March 2, 1945. According to present plans, this vacancy will not be filled until after the war. In the meantime, the district will be divided between two of the other leaders, but if the amount of cooperative control work during 1945 warrants such action, a temporary employee will be assigned to assist in the supervisory activities.

District Leaders Strait and McCasland, of New York, were transferred to farm foresters' positions with the U. S. Forest Service on July 6, 1944 and October 16, 1944 respectively. District Leader Kresge, also of New York, was transferred to a similar position with the Soil Conservation Service effective April 17, 1944. No replacements have been made for these New York leaders and such action may not be necessary for the duration of the war. State employees are now supervising control activities in two of the New York districts and Essex County has been added to the Warren County district.

District Leader Harpp was promoted to a new position as assistant state leader in New York effective April 1, 1944. After serving in that capacity for a few months, he requested a transfer back to Warren County as district leader, which was approved on September 16, 1944. The duties of the assistant state leader's job, which is vacant at the present time, include part-time employment on gypsy moth control supervisory activities under a cooperative agreement with the Division of Gypsy and Brown Tail Moth Control.

No permanent employees of the Division in this region entered the armed services during 1944. The majority of them are beyond the age limit for such duty.

The following organization chart gives detailed information on the permanent federal personnel employed on blister rust control activities during 1944 in the Northeastern Region.



State Leader Newman of New Hampshire also supervises control activities in the Rockingham District.

District Leaders in New Hampshire and Vermont spend one quarter of their time in forest fire protection and other forestry activities.

Cooperation on Other Forestry and Pest-Control Projects

At the request of the U. S. Forest Service and the New York Conservation Department, arrangements were made to detail four of the New York district blister rust control leaders to the Timber Production War Project effective December 1, 1943. The assignment of one of these leaders was terminated on February 29, 1944. Two others were released on March 31st, while the services of the fourth leader were continued until May 15th. One of the New York leaders was again detailed to the T.P.W.P. for four months starting December 1, 1944. The value of our district leaders' services on this project is indicated in the following excerpt from a letter to the regional leader from Mr. A. B. Recknagel, area forester in charge of the Timber Production War Project in New York State:

"I want to thank you for the great help the blister rust men in this state have been giving the Timber Production War Project during the past winter and early spring. I know that without their help we would have been much less able to cope with the problems that arose due to the necessity of speeding up production of lumber, pulpwood and other forest products. Their intelligence and contact with the local people made the task not only easier but assured success."

The blister rust leaders in Pennsylvania and those in New York, who were not detailed to the T.P.W.P., also rendered valuable aid to that project in stimulating local production of forest products in conjunction with their regular duties. In the other states, our leaders assisted the T.P.W.P. personnel chiefly by furnishing them valuable information on local conditions as regards amount of white pine, etc.

Effective November 1, 1944, two of the New York district leaders were detailed to the Division of Gypsy and Brown Tail Moths Control. The detail of one of these leaders was terminated on December 31, 1944, but the other leader was assigned to that Division until March 31, 1945.

Our personnel made many contacts with other forestry officials, timber operators, and private land owners while detailed to these special projects which will be of great value to them on future blister rust control activities.

Stem Rust Collections on Barberry and Grain

In the Spring of 1944, the blister rust control leaders were requested to make collections of viable stem rust on barberry leaves and on grains and grasses for Dr. E. C. Stakman at the Federal Rust Laboratory, University Farm, St. Paul, Minnesota. This material was for use in connection with a study of the distribution and prevalence of the different physiologic races of the stem rust fungus. The limited scope of operations in the stem rust control work, together with travel restrictions, reduced the locations from which collections could be made

by their employees, and other agencies were called on for assistance. Our leaders were instructed to make the desired collections from any locations of barberry or grain fields that were convenient for them to observe in connection with their travel on blister rust control.

Seventeen of the blister rust control leaders in six states furnished Dr. Stakman with 34 rusted barberry specimens, while ten grain and grass collections were made by three leaders in two states. A report received from Dr. Stakman on October 30, 1944 advises that the collections in general were in excellent condition when received at St. Paul. Although quite a number of the collections failed, the results obtained were interesting and valuable. The reason for failure of some of them probably was that they were of some of the grass rusts that do not attack cereals, such as Fuccinia graminis agrostidis or P. graminis poae. Seven of the barberry specimens were found to be infected with P. graminis tritici, races 17, 38, 39A, and 56. One other barberry specimen was infected with P. graminis avenae, race 2. There were two immature specimens and six were still in the process of identification at the time of Dr. Stakman's report. The remainder failed to show any of the rust. Dr. Stakman advised it is interesting that races 17, 56 and 38 appeared as segregates on the barberries in this section of the country where very little wheat is grown. The occurrence of race 59A in Massachusetts was also of special interest.

Collection of Soil Samples For Penicillin Research

Dr. Clyde M. Christensen, In Charge of the Penicillin Project, University Farm, St. Paul, Minnesota also requested the cooperation of our permanent personnel during the Spring of 1944 in sending him soil samples from the different Northeastern States for use in penicillin research. Twenty four of our employees sent soil to Dr. Christensen.

Informational and Service Activities of District Leaders

The substantial amounts of local funds, which have been made available for cooperative control work in this region were primarily a result of effective informational and service work by the blister rust control leaders. Such activities are especially important in the States of Maine, New Hampshire, Vermont, Connecticut and New York where town and county appropriations constitute a relatively large proportion of the total cooperative funds provided for control work. However, some informational and service work is essential in all states in order to stimulate interest and keep the public informed regarding the disease and the status of control activities. The

principal methods used on blister rust work in disseminating information to the public are: talks at meetings supplemented by motion pictures, news items in local papers, distribution of illustrative material and publications, roadside demonstrations, and displays at fairs and in store windows. A few radio talks have been given by the blister rust leaders, but greater use should be made of such facilities. Informational work creates interest in the control program, but personal interviews with pine owners, local officials and other interested persons, as well as field demonstrations of the disease and control methods, are essential to obtain local cooperation.

Table 1 summarizes the district leaders' 1944 informational and service activities by states. On the basis of regional totals there were decreases in number of meetings, attendance at meeting, items published and initial interviews while increases occurred in the other items as compared with the previous year's accomplishments. The most noteworthy increases were in the use of exhibits, chiefly window displays, in Maine and Vermont, where 106 such demonstrations were placed in 1944 as compared with 27 in 1943. The 1944 automobile mileage allotment for this region was adequate to conduct essential information and service activities, but every effort was made to keep travel in connection with such work down to a minimum consistent with effective results.

The need for new illustrative materials, publications, films, etc. was discussed in detail at the state leaders' conference held at Cambridge, Mass., in November, 1944. Several suggestions were submitted including the preparation of a new bulletin on control methods along the lines of the publication "Wood-You Believe It"; series of photographs showing various phases of blister rust control as well as charts and graphs for use at hearings; colored cartoon film; new blister rust sound film, preferably a story-type similar to the old silent film "The Pines"; and the possibility of making recordings for radio talks.

State Leader Foss is planning to get out a new state blister rust publication in New York. The regional office is also planning to prepare a paper on the Acadia National Park project, which demonstrates very clearly the effectiveness of control measures, and a revision of the bulletin on the Waterford Damage Study as well as a revised "Steps of Progress" Chart. State Leader Perry recently submitted a scenario for a new blister rust motion picture based on the history of the disease in the Northeast and the methods of control. He has also revised the manual for blister rust field personnel and it is hoped that it can be reproduced for use in 1945.

Table 25 in the Appendix summarizes the results of all informational and service activities, by states, during the period 1923 to 1944, inclusive.

Table 1 - Summary of Informational and Service Activities of
District Blister Rust Control Leaders During Calendar Year 1944

Informational Activities

State	Meetings Addressed		No. Items Published	No. Demonstrations Placed
	Number	Attendance		
Maine	29	3,148	10	32
N. H.	138	9,753	64	8
Vt.	42	2,512	18	74
Mass.	27	3,836	14	5
R. I.	4	245	-	1
Conn.	5	135	-	1
N. Y.	76	7,526	100	6
Penna.	2	40	9	6
All States	323	27,195	215	133

Service Activities

State	No. Initial Interviews	No. Follow-up Calls	No. Individuals Instructed in Field
Maine	1,048	596	224
N. H.	1,337	1,524	597
Vt.	312	959	70
Mass.	520	104	68
R. I.	51	43	4
Conn.	109	76	27
N. Y.	1,712	1,832	1,428
Penna.	380	71	364
All States	5,469	5,205	2,782

Ribes Eradication Work By District Leaders

Due to the limited number of men available for ribes eradication work in some of the districts during 1944, it was possible for the blister rust control leaders to do a considerable amount of scouting work to locate and remove ribes from definite blocks in townships suitable for this type of work.

As indicated in Table 2, the blister rust leaders in seven states spent 150 man days scouting 25,188 acres, a total of 6,079 wild and cultivated ribes being removed on the areas examined. This acreage scouted by the permanent personnel represents over 6% of the total area worked in the region in 1944. In Pennsylvania, blister rust control leaders personally scouted 7,531 acres or approximately one-third of the total acreage covered in that state.

The results of the district leaders' scouting work are also included in Table 7 in Part III of this report, which summarizes the results of all control work on state and privately-owned lands, as well as in Table 32 of the Appendix.

Table 2 - Ribes Eradication Work Performed By Blister Rust Control Leaders During 1944

State	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Ribes Per Acre	Acres Per Man Day
			Wild & Cult.	Cult. Only			
Maine	Initial	1,902	705	-	8	0.4	237.8
	Re-Work	1,876	210	-	6	0.1	312.7
	Total	3,778	915	-	14	0.2	269.9
N. H.	Initial	347	92	-	4	0.3	86.7
	Re-Work	1,470	741	-	15	0.5	98.0
	Total	1,817	833	-	19	0.5	95.6
Vt.	Initial	502	1,218	-	9	2.4	55.8
	Re-Work	94	187	-	1	2.0	94.0
	Total	596	1,405	-	10	2.3	59.6
Mass.	Initial	2,117	182	-	14	0.1	151.2
	Re-Work	6,909	961	-	53	0.1	130.4
	Total	9,026	1,143	-	67	0.1	134.7
R. I.	All Re-Work	1,205	81	-	12	0.07	100.4
N. Y.	Initial	420	323	12	7	0.8	60.0
	Re-Work	815	780	4	9	0.96	90.6
	Total	1,235	1,091	16	16	0.9	77.2
Penna.	Initial	404	429	-	2	1.1	202.0
	Re-Work	7,127	182	-	10	0.02	712.7
	Total	7,531	611	-	12	0.08	627.6
All States	Initial	5,692	2,937	12	44	0.5	129.4
	Re-Work	19,496	3,142	4	106	0.2	183.9
	Total	25,188	6,079	16	150	0.24	167.9

Other Special Field Work By District Leaders

Many of the district leaders spent considerable time on other important special field activities which included the following:

1. Placing definite units of control area on maintenance as a result of current field inspections.
2. Examination of control areas where no work had been performed for eight or more years to determine need for rework based on existing conditions as regards pine, ribes and infection.
3. Inspection of portions of control areas affected by the hurricane of 1938 and/or logging operations prior to 1941 to determine amount of existing or potential white pine. Areas with inadequate pine stocking were discontinued from control area and permanent maps and records revised accordingly.

In connection with activities under Items 2 and 3, it was possible in many instances to reduce the width of the protection zones. In the case of Item 3, this would apply only to units retained in the control area.

This special field work by the district leaders resulted in a total of 208,682 acres being examined. Of this total, 72,488 acres were found to be in need of rework, 15,557 acres were placed on maintenance, and 120,637 acres were discontinued from the control area because the present pine stocking did not meet minimum stocking requirements or as a result of a reduction in the width of protection zones.

The blister rust control leaders were also instructed to designate on maps the location of as many cut-over areas as possible. This is a tremendous task in some sections of the region due to the extensive cutting since 1941 in connection with the production of lumber for the war effort. Reliable information as to pine regeneration in logged areas cannot be obtained for at least three years after cuttings occur.

Control Area Mapping By District Leaders

Seven of the district blister rust control leaders in New Hampshire, Massachusetts, Rhode Island, New York and Pennsylvania also spent 194 man days on control area mapping work in 1944. These leaders mapped 29,811 acres in detail and eliminated an additional 45,171 acres which did not contain sufficient white pine to justify control measures.

The results of the district leaders' detail mapping work are included in accomplishments reported for state and private lands on Page 26 and in Table 28 of the Appendix.

War Bond Purchases By Permanent Federal Personnel

Thirty eight, or 95%, of the 40 federal appointees employed on blister rust control work in this region during the calendar year 1944 participated in the payroll deduction plan for purchasing war bonds. However, the two men who did not participate in the payroll plan purchased bonds during the special campaigns. One of these employees receives a rather small salary and has a large family. Total deductions for bond purchases during the year amounted to \$13,380.12, which represents 10.1% of the gross payroll.

During the Fourth, Fifth and Sixth War Loan Drives, the blister rust control personnel reported additional cash bond purchases totalling \$6,305.63. The percentage of the quota attained in each of these special drives was as follows: Fourth - 180.7%, Fifth - 81.9%, and Sixth - 104.8%.

Total purchases of war bonds, both under the payroll deduction plan and during the three special war loan drives during 1944, amounted to \$19,745.75 (purchase price of bonds) which represents 15% of the gross payroll for the 40 permanent federal employees in the region, or an average of \$493.64 per person. This does not include any cash purchases which may have been made outside the periods covered by the special war loan drives, as such purchases were not reported to the regional office.

Table 3 - Expenditures and Contributed Services for Work Project BLR-1-1
During Calendar Year 1944

State	Value of Contributed Services by States				B.E. and P.Q. Expenditures (3101.14)	Grand Total
	Office Space and Equipment*	Clerical Assistance*	Technical Services of Other State Employees	Total		
Maine	\$ 203.00	-	\$ 260.00	\$ 463.00	\$ 21,231.02	\$ 21,694.02
N. H.	390.00	-	150.00	540.00	19,770.37	20,310.37
Vt.	180.00	143.44	660.00	982.44	14,373.93	15,356.37
Mass.	240.00	720.00	-	960.00	19,187.77	20,147.77
R. I.	48.64	184.96	500.08	733.68	-	733.68
Conn.	350.04	-	799.99	1,050.03	4,898.08	5,948.11
N. Y.	249.96	450.00	5,000.04	5,700.00	22,013.93	27,713.93
Penna.	185.00	150.00	162.00	497.00	12,496.73	12,993.73
All States	\$1,746.64	\$1,647.40	\$7,532.11	\$10,926.15	\$113,971.83	\$124,897.98

*During period January 1 to June 30, 1944 - such contributed services credited to Project BLR-3-1 starting July 1, 1944.

Table 4 - Classification of Federal 3101.14 Expenditures for Work Project BLR-1-1
During Calendar Year 1944

State	Salaries of Appointees	L/A Expenditures	Leases	Purchase Orders	Total
Maine	\$17,963.22	\$ 3,003.80	\$ 264.00	-	\$ 21,231.02
N. H.	18,736.03	614.29	420.00	-	19,770.37
Vermont	12,237.13	2,136.81	-	-	14,373.93
Mass.	18,135.94	931.83	120.00	-	19,187.77
R. I.	-	-	-	-	-
Conn.	4,128.24	769.84	-	-	4,898.08
N. Y.	16,715.06	4,924.21	368.00	6.66	22,013.93
Penna.	10,917.34	1,435.39	144.00	-	12,496.73
All States	\$98,833.00	\$13,816.17	\$1,316.00	\$6.66	\$113,971.83

Tables 3 and 4 do not include Federal 3101 expenditures for the Cambridge regional office totalling \$28,820.26, which consisted of \$25,914.18 for salaries of appointees, \$2,581.08 L/A expenses, and \$325.00 for leases. Dr. Rusden's salary and expenses for the entire year are included in the Cambridge Office expenditures.

PART III

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATELY-OWNED LANDS IN NORTHEASTERN REGION - WORK PROJECT BLR-3-1

GENERAL STATEMENT

White pine is the principal forest tree over a considerable portion of the Northeastern Region and over 99% of the white pine forests are in state or private ownership, chiefly farm wood lots. The present net control area on state and privately-owned lands comprises 12,580,224 acres of which 4,223,897 acres are in white pine growth meeting stocking requirements established in this region. There is also a large acreage outside the present net control area, which contains white pine chiefly in mixture with other species, but the pine stocking is not sufficient to justify the cost of control measures.

As a result of the ribes eradication work performed during the period 1918-1944, inclusive, initial control has been established on 10,808,452 acres or 85.9% of the present net control area on state and private lands. Approximately 35% of this control area has been worked twice and 4.5% has been examined three times. In addition, several hundred thousand acres have been worked but were later discontinued from the control area in reducing width of protection zones and because the white pine in other sections no longer met minimum stocking requirements due to logging, fire, hurricane damage, etc.

Control work on state and private lands is being conducted under cooperative agreements between the Bureau of Entomology and Plant Quarantine and the nine states in this region. However, operations in New Jersey were suspended after 1937 since the control area in that state, comprising only 16,742 acres, is on a maintenance basis. Under the provisions of the Lea Act, federal funds have been allotted to the various states since July 1, 1941 for control work on state and privately-owned lands with the provision that such allotments be matched on at least a dollar for dollar basis by state and local cooperative funds or direct services. In spite of war-time conditions, the states and local cooperators have continued to give active support to the control program and in several instances their appropriations have been increased since 1941.

State and Local Cooperation on Project BLR-3-1

State and local cooperative expenditures and contributed services for control work on state and privately-owned lands (Work Project BLR-3-1) during the calendar year 1944 amounted to \$86,365.09 which was an increase of 13.4% over the previous year. Table 12 on Page 41 gives detailed information on such 1944 cooperative expenditures and contributed services as well as Federal 3103 expenditures by states.

In Maine, New Hampshire, Massachusetts, Connecticut and New York, state funds are appropriated specifically for blister rust control, while in Vermont, Rhode Island and Pennsylvania allotments for such control activities are obtained from

other state appropriations usually for general forestry work. Funds from other state appropriations have also been made available in New Hampshire and Massachusetts. The state blister rust control appropriations for the fiscal year 1945 in the five states mentioned above totalled \$42,155.00 and were the same as for the preceding year except in New Hampshire where there was a slight increase of \$50.

Nine counties in New York appropriated \$11,345.00 for control work during 1944, but actual expenditures from the funds amounted to \$10,380.66. In addition, counties in New York contributed services valued at \$1,156.26, making a total of \$11,536.91 for county cooperation on Project BLR-3-1 which is an increase of \$3,984.03 or 52.6% as compared with 1943.

Town cooperation was solicited during 1944 in Maine, New Hampshire, Vermont, Connecticut and in one New York district. A total of 125 towns in these five states appropriated \$26,700.00 as compared with 108 town appropriations totalling \$25,578.00 in 1943. The most noteworthy increase in town cooperation occurred in Vermont where 25 towns made \$5,350.00 available for control work in 1944 compared to 12 town appropriations totalling \$2,550.00 in 1943. In addition to the 1944 town appropriations in the five states indicated above, four cities and towns in Massachusetts also spent \$162.02 for ribes eradication work on their watershed properties. In Connecticut, 17 towns raised \$3,563.00 for control work, but only \$470.00 of this amount was expended during 1944. Seven Connecticut towns have established special sinking funds, eight others have no special sinking fund but are making annual allotments available for control work on an accumulative basis, while four additional towns are making regular allotments from other established appropriations. During the period 1940-1944 inclusive, 18 towns in Connecticut made available for blister rust control \$11,122.30, of which only \$1487.15 was actually spent and \$2,119.00 reverted to the town treasuries. At the end of 1944 there was an unexpended balance of \$7,516.15 town money available for future control work in Connecticut. Due to the acute labor shortages in some localities, it was not possible to spend all of the town funds which were raised during 1944 in Maine, New Hampshire, Vermont and New York. Town appropriations in these four states amounted to \$23,137.00 of which \$17,054.70 was expended. In some instances, the unexpended balances will be carried over to 1945.

A total of 53 individual cooperators spent \$833.98 on ribes eradication work during 1944 compared with an expenditure of \$906.56 by 47 owners in 1943.

Table 26 on Page 56 of the Appendix lists detailed information on local cooperative expenditures by states during 1944.

As previously mentioned, the states and local cooperators have continued to give excellent support to the control program in this region even under war conditions. In fact, total state and local cooperative expenditures and contributed services have increased each year since 1942 as indicated in Table 5.

Table 5 - State and Local Cooperative Expenditures and Contributed Services
For Project BLR-3-1 During Period 1942-1944, Inclusive

Calendar Year	States	Counties	Towns	Individuals	Total
1942	47,628.17	9,534.75	15,601.04	2,193.91	74,957.87
1943	50,315.35	7,552.88	17,400.82	906.56	76,175.61
1944	56,307.48	11,536.91	17,686.72	833.98	86,365.09
Totals	154,251.00	28,624.54	50,688.58	3,934.45	237,498.57

Table 11 on Page 40 gives a comparison, by states, between federal 3103 expenditures and state and local cooperative expenditures and contributed services for Project BLR-3-1 during the fiscal years 1942 to 1944, inclusive.

Control Area Mapping - 1944

Due to the advisability of conserving funds for ribes eradication activities, only a limited amount of control area mapping was performed in 1944. A few temporary employees were assigned to such projects for varying periods in New Hampshire, Rhode Island and New York. Seven of the district leaders also performed detail mapping. A total of 64,939 acres was mapped in detail and 61,191 acres of non-pine land definitely eliminated from control work as a result of 995 man-days of labor by all employees.

Tables 28 to 31 in the Appendix summarize the results of the 1944 mapping work by states, accomplishments for the period 1933-1944 by states and programs, and the present status of the mapping project in each state.

Availability and Type of Labor

In spite of war conditions, a maximum of 496 temporary workers were employed on blister rust control work on state and private lands during the 1944 ribes eradication season. Of this total, 304 were used in Maine and New York. Every effort was made to avoid hiring men who were needed on agricultural work or in war industries. The crews were composed chiefly of high school boys and men above the draft age or with slight physical handicaps which prevented their assignment to war industry. In most instances, the older men and boys were interested in the work and accomplished good results; although in some cases their production rate was below the usual standard. A special effort was also made to obtain the services of discharged war veterans, but very few of them were interested in such employment chiefly due to the low wage rates and our inability to offer full-time employment. Some of the veterans employed were not satisfactory due apparently to a neurotic condition. In spite of higher wage rates paid for other work and many other complicating factors, the district leaders made a commendable showing in securing laborers and in accomplishing worth-while results on control activities.

The following table indicates the maximum number of men employed in any semi-monthly period during the 1944 field season in each of the Northeastern States.

Table 6 - Temporary Personnel Employed on Ribes Eradication During 1944
(Work on State and Private Lands Only)

State	Maximum Number of Laborers, Scouts and Foremen Employed			
	Workers Paid From Federal 3103 Funds		All Employees	
	Number	Period	Number	Period
Maine	83	August 16-31	124	August 16-31
N. H.	58	July 16-31	59	July 16-31
Vt.	36	August 1-15	43	August 1-15
Mass.	18	July 16-August 15	34	July 16-31
R. I.	2	May 1-September 30	4	May 1-September 30
Conn.	9	August 16-31	14	August 1-15
N. Y.	123	" "	180	July 16-31
Penna.	30	June 16-30	38	July 16-31
All States	359	-	496	-

Data for federal 3103 employees were compiled from copies of payrolls at the regional office, while the information for all workers was obtained from semi-monthly personnel reports.

A maximum of 359 laborers, scouts and foremen were employed on federal 3103 funds during a single semi-monthly period at the peak of the 1944 season which occurred at slightly different times in the various states as indicated in Table 6. The total number of temporary workers employed (regardless of length of service) on federal 3103 money was 546. However, the difference between this number and the maximum of 359 does not represent the actual turn-over since some of the temporary employees were on the federal payrolls for varying periods and later paid from state or local cooperative funds or vice versa.

Ribes Eradication Work During 1944

The weather during May and the first half of June was especially favorable for control work since very little time was lost due to rain. It was possible to start the ribes eradication activities in all states not later than May 8th which is at least a week earlier than normal in the northern part of the region. During May, a 117 year record was broken when less than a half inch of rainfall was recorded at the Boston station of the U. S. Weather Bureau. The drought continued until late in June when heavy rains occurred. The U. S. Weather Bureau station at Concord, N.H., reported 7.97 inches of rain for the week ending June 24th, 4.31 inches of which fell during a 24 hour period on June 21st.

Ribes eradication work was performed on 410,688 acres of state and privately-owned lands during 1944, a total of 2,484,754 wild and cultivated ribes being destroyed as a result of 28,973 man days labor. Table 7 summarizes the accomplishments by states and types of work.

Table 7 - Ribes eradication work on State and Private Lands During 1944

State	Type of Work	Total Acreage Worked	% Total For Each State	Average Acreage Worked Per District in Each State	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
					Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	Initial	23,046	31.3	5,761	324,831	186	2,038	14.1	.09	11.3
	Rework	50,475	68.7	12,619	529,790	78	3,934	10.5	.08	12.8
	Total	73,521	100.0	18,380	854,621	264	5,972	11.6	.08	12.3
N. H.	Initial	5,812	28.7	1,162	85,561	20	872	14.7	.15	6.7
	Rework	14,427	71.3	2,885	196,721	0	2,372	13.6	.16	6.1
	Total	20,239	100.0	4,047	282,282	20	3,244	13.9	.16	6.2
Vt.	Initial	9,210	51.5	3,070	71,925	26	989	7.8	.11	9.3
	Rework	8,687	48.5	2,896	98,226	2	1,265	11.3	.15	6.9
	Total	17,897	100.0	5,966	170,151	28	2,254	9.5	.13	7.9
Mass.	Initial	7,749	17.9	1,937	10,749	49	313	1.4	.04	24.8
	Rework	35,635	82.1	8,909	77,633	476	2,089	2.2	.06	17.1
	Total	43,384	100.0	10,846	88,382	525	2,402	2.0	.06	18.1
R. I.	Initial	703	12.4	703	0	0	38	0	.05	18.5
	Rework	4,962	87.6	4,962	3,332	0	462	0.7	.09	10.7
	Total	5,665	100.0	5,665	3,332	0	500	0.6	.09	11.3
Conn.	Initial	1,005	4.1	502	388	0	51	0.4	.05	19.7
	Rework	24,265	95.9	12,133	50,218	0	600	2.1	.02	40.4
	Total	25,270	100.0	12,635	50,606	0	651	2.0	.03	38.8
N. Y.	Initial	37,413	18.5	4,677	379,468	135	2,902	10.1	.08	12.9
	Rework	164,989	81.5	20,623	472,246	969	8,575	2.9	.05	19.2
	Total	202,402	100.0	25,300	851,714	1,104	11,477	4.2	.06	17.6
Penna.	Initial	13,609	61.0	4,536	126,371	591	1,686	9.3	.12	8.1
	Rework	8,701	39.0	2,900	57,295	37	787	6.6	.09	11.1
	Total	22,310	100.0	7,436	183,666	628	2,473	8.2	.11	9.0
All States	Initial	98,547	24.0	3,285	999,293	1,007	8,839	10.1	.09	11.1
	Rework	312,141	76.0	10,405	1,485,461	1,562	20,084	4.8	.06	15.5
	Total	410,688	100.0	13,690	2,484,754	2,569	28,923	6.1	.07	14.2

Compared with the previous year, there was an increase of 12.8% in acreage cleared of ribes on state and privately-owned lands during 1944. There was also an increase of 3.0% in man days employment on such control work, but a decrease of 2.7% in number of ribes destroyed. Over 49% of the total regional acreage was in New York State where there was an increase of nearly 33% in acreage examined compared with the preceding year in spite of a decrease of 1.1% in man days labor in that state. However, due to cooperative state and local funds available, New York received 41.7% of all federal \$103.14 money allotted to the region during the fiscal year 1945.

As indicated in Table 7, 76% of total acreage cleared of ribes in the region during 1944 represented rework. This is to be expected since the initial work has been completed on approximately 86% of the present net control area on state and private lands. In Rhode Island, Connecticut and New Jersey all of the initial work has now been completed, while in Massachusetts and New Hampshire the percentages are 98.1 and 91.1%, respectively. In the other states, the percentages range from 58.4 in Vermont to 86.4 in Maine. The amount of initial control work in Vermont and Pennsylvania, however, did exceed the acreage of rework during 1944. In these two states, 41.6% and 29.2%, respectively, of the control area is still in need of initial protection. As a result of future examinations, it may, however, be possible to discontinue a part of this acreage still needing initial protection.

The following tabulation lists acreages reworked on state and privately-owned lands during 1944 in each of the Northeastern States.

Acreage Reworked During 1944

<u>State</u>	<u>Second Working</u>	<u>Third Working</u>	<u>Total</u>
Maine	47,096	3,379	50,475
N. H.	12,236	2,191	14,427
Vt.	7,460	1,227	8,687
Mass.	32,836	2,799	35,635
R. I.	2,066	2,896	4,962
Conn.	6,406	17,859	24,265
N. Y.	101,830	63,109	164,939
Penna.....	3,148	5,553	8,701
All States	213,128	99,013	312,141

The acreage worked per district in the region as shown in Table 7 averaged 13,690 acres and ranged from 4,047 acres in New Hampshire to 25,300 acres in New York. No satisfactory comparison can be made of the district averages for the respective states since there are several factors influencing the volume of control work such as amount of state and local cooperation, availability and quality of labor, abundance and distribution of ribes, and use of scout or crew methods. The allotment of federal 3103 funds for ribes eradication in each state is dependent chiefly on the amount of state and local money available for such activities. The relatively low acreage worked per district in New Hampshire during 1944 was primarily due to the acute labor shortage in that state.

An analysis of the ribes per acre values for the 1944 control work shows that an average of 10.1 bushes per acre were destroyed on all initial work compared with 4.8 ribes per acre on the rework. The average of 6.1 bushes per acre for both classes of work is an "all-time" low for the region. There has been a general decrease in the average number of ribes destroyed on the areas worked since 1940 primarily due to the following reasons: (1) most of the tracts with heavy ribes concentrations had already been worked, many of them in connection with control projects under the Emergency Programs; (2) the volume of second and third work has greatly increased - 76% of total in 1944 as against 52% in 1939; and (3) district leaders have personally scouted a considerable acreage during past few years, especially in those districts where few crews were employed.

As indicated in Table 7, the average number of ribes per acre for the rework slightly exceeds that for initial work in four states. On the basis of district averages, the differences are more striking in a few instances. However, no direct comparison should be made of such per acre values as the same areas are not involved. Other reasons for these differences are that many of the areas initially protected during 1944 contained relatively few ribes, whereas in selecting areas for rework preference was given to tracts where many bushes had been pulled on the initial work. In the three southern New England States, where 60 percent of the control area is on a maintenance basis, the 1944 ribes per acre values in the areas requiring control work are exceptionally low. It would appear that not much work was needed. However, these low average figures are misleading as portions of the areas do contain a considerable number of ribes which must be removed in order to give adequate protection to the pines.

The rework in this region is complicated since the forest types are greatly diversified, small, intermingled, and uneven-aged. Frequently, 15 to 20 years have elapsed between workings and numerous changes have occurred meanwhile in forest types due to natural growth, logging, fire, hurricane, and other causes. Experience has shown that the ribes regrowth is greatest in sites where there has been soil disturbances. Most field men have reached

the conclusion that regardless of the amount of ribes found initially on an area, it should be examined in its entirety when rework is performed several years after the initial coverage due to many changes which may have occurred and to make sure that an effective job is performed. Large portions of many of the control areas, especially in southern New England, can be reworked rapidly by scouting methods and placed on a maintenance basis.

The permanent ribes eradication record system adopted in this region in 1940 made no provision for keeping separate data on third and subsequent workings. However, it was possible to obtain separate acreage figures for third workings by planimetering such areas on the permanent control area maps. Action was taken to obtain such acreage figures in 1943 and it was ascertained that over 450,000 acres in the net control area had been worked three times. In 1944, the state leaders were requested to furnish separate acreage figures for second and third workings in their yearly statistical reports, but the ribes and man hours data were to be combined for all rework. Provision has also been made for all district leaders to keep separate data for second and third workings on the CO-105 permanent record forms, or on special forms provided for this purpose. The 99,013 acres worked in 1944 for the third time represents over 24% of all control work performed on state and private lands during that year.

Checking of Ribes Eradication Work

In this region the efficiency of the ribes eradication work is determined chiefly in two ways: one, having the crews frequently check portions of their own work; and two, supervisory checks made by the district blister rust control leaders. In a few instances, especially in New York, state foremen have assisted on such supervisory checking activities. The data obtained on the crew checks are made available to the district and state leaders, but such checking reports are not submitted to the regional office.

Supervisory inspections of the ribes eradication work include observations of crews at work and measured general checks in completed areas. Crew inspections are especially important because they keep the blister rust control leaders in close touch with any special problems that may arise and enable them to take immediate action to correct any faulty procedures. In making measured general checks, sample strips, a half rod or rod in width, are run through the most likely ribes sites in worked areas and a record kept of the acreage examined, number of ribes found and the footage of live stem of such bushes missed by the crews or scouts. If the checks show more than 20 feet of live stem per acre, which is the maximum for approved work in this region, the work is disapproved and corrective action is taken which usually involves sending a scout or crew back into the area to rework a relatively small portion in order to bring the entire job up to standard.

During 1944, no detail reports of the supervisory observations of crews at work were submitted to the regional office. However, the district leaders indicated on their EQ-78 reports the number of checks and the time they spent on such supervisory work each week. A special form was provided for recording the data obtained on each measured general check. These checking reports were forwarded to Cambridge weekly and the regional office prepared semi-monthly state summaries, copies of which were sent to the respective blister rust control leaders.

Table 8 summarizes the results of the measured general checking work by states and gives a break down of the data on the basis of averages per district. Over a third of these systematic checks were made by foremen or checkers who assisted the district leaders on such activities in Maine, Rhode Island and New York. In the latter state, nearly 70% of all checks were made by such men. For the region as a whole, the acreage checked was approximately the same as in 1943 although such checks comprised only 0.54% of the total acreage worked during 1944, compared with 0.62% the previous year. It is interesting to note that the average live stem per acre found on all checks (7.6 feet) was exactly the same for both years, and the control work was approved on 94.5% of the areas checked in 1944 as against 94.2% the preceding year. The averages per district show quite a wide range in the volume of checking work in the various states, but there were several factors which reduced the amount of such work in some of the states. For example, in Maine and some of the New York districts, it was necessary for the blister rust control leaders to devote a large portion of their time to securing labor, training new personnel and directing the field activities. Due to the fact that 76% of the acreage cleared of ribes this year represented reworkings, many portions of these areas required only a limited amount of checking because of the scarcity of ribes.

The control work was approved on 94.5% of the areas in which measured general checks were made in 1944. However, in Pennsylvania, Rhode Island and Connecticut, the percentages were 80.8, 82.6, and 84.6, respectively. In the latter two states, the checks were restricted chiefly to sites where ribes concentrations were encountered. These comprised only a relatively small percentage of the total acreage worked. The majority of the disapproved checks in Pennsylvania were areas which had a large ribes population. In some of these tracts, it is very difficult to reduce the ribes live stem to the standard maximum of 20 feet or less by one working. The major portion of the disapproved work in Pennsylvania was in one district where labor difficulties were experienced. It was necessary for the district leader to release a few employees, chiefly high school boys, because of their unsatisfactory work.

An analysis of the ribes live stem data for the checks where the work was disapproved shows the following:

<u>State</u>	<u>No. Checks Where Work Disapproved</u>	<u>Average Live Stem Per Acre Found on Checks in Disapproved Areas</u>	<u>Maximum Live Stem Per Acre Found on Checks in Any Disapproved Area</u>
Maine	3	28.9	44.6
N.H.	7	26.7	29.3
Vt.	9	48.8	87.0
Mass.	13	39.2	96.0
R.I.	4	27.0	41.2
Conn.	8	45.3	128.0
N.Y.	17	25.0	60.0
Penna.	23	38.3	140.7
All States	84	34.5	140.7

Table 8 - Results of Measured General Checks of Ribes Eradication Work During 1944

State	Checks Made By	No. Checks	Hours Check- ing	Acres In Strip Checks	Ribes Found On Checks		Ribes Live Stem Found on Checks		Control Work	
					Total No.	Ave. Per Acre	Total FLS	FLS Per Acre	Approved	Disapproved
Maine	District Leaders	48	67	58.76	189	3.2	480	8.2	45	3
	Erad. Assistant	30	30	24.80	112	4.5	169	6.8	30	-
	Total	78	97	83.56	301	3.6	649	7.8	75	3
N. H.	District Leaders	108	162	86.38	455	5.3	1,010	11.7	101	7
Vt.	" "	134	195	181.92	962	5.3	2,038	11.2	125	9
Mass.	" "	314	358	328.85	883	2.7	2,671	8.1	301	13
R. I.	District Leader	17	40	16.94	65	3.8	147	8.7	14	3
	Erad. Assistant	6	13	4.24	35	8.3	38	9.0	5	1
	Total	23	53	21.18	100	4.7	185	8.7	19	4
Conn.	District Leader*	52	78	73.35	506	6.9	863	11.8	44	8
N. Y.	District Leaders	211	373	315.88	753	2.4	1,729	5.5	207	4
	Erad. Assistants	482	1,010	982.23	2,057	2.1	5,536	5.6	469	13
	Total	693	1,383	1,298.21	2,810	2.2	7,265	5.6	676	17
Penna.	District Leaders	120	172	159.69	917	5.7	2,213	13.9	97	23
All States	District Leaders	1,004	1,445	1,221.67	4,730	3.9	11,151	9.1	934	70
	Erad. Assistants	518	1,053	1,011.37	2,204	2.2	5,743	5.7	504	14
	Total	1,522	2,498	2,233.04	6,934	3.1	16,894	7.6	1,438	84

*Includes two checks reported by State Leader Riley.

Analysis

State	No. Districts	Averages Per District				% Total Acreage Worked During 1944 Covered by Measured General Checks	% Worked Areas Checked Which Were Approved
		Acreage Cleared Of Ribes*	No. Measured General Checks	Hours on Measured General Checks	Acreage of Measured General Checks		
Maine	4	18,380	19.5	24.3	20.89	0.17	96.2
N. H.	5	4,047	21.6	32.4	17.28	0.43	93.5
Vt.	3	5,968	44.7	65.0	60.64	1.02	93.3
Mass.	4	10,846	78.5	89.5	82.21	0.76	95.9
R. I.	1	5,665	23.0	53.0	21.18	0.37	82.6
Conn.	2	12,635	26.0	39.0	36.68	0.29	84.6
N. Y.	8	25,300	86.6	172.9	162.28	0.64	97.5
Penna.	3	7,436	40.0	57.3	53.20	0.72	80.8
All States	30	13,690	50.7	83.3	74.43	0.54	94.5

*All work on state and private lands.

Transportation of Workers Employed on Ribes Eradication Work

In most instances it was necessary to furnish transportation for the crews employed on the 1944 ribes eradication work. Due to the tire and gasoline shortages, most employees who owned cars were reluctant or unable to use them in getting to and from work. Our Division furnished 43 trucks for crew transportation, 13 of these machines being assigned to Maine. In New York several state and county-owned trucks were also available to transport crews, and one state truck was used in Connecticut.

At the present time there are 45 government owned half-ton pick-up or sedan delivery trucks on hand in this region. Of this total, 19 are 1935 models, 14 were manufactured in 1936, and the remaining 12 are of 1939 make. Many of these trucks have been operated from sixty to over a hundred thousand miles and their maintenance and repair costs are now relatively high. During the early part of 1944, arrangements were made to have several of our trucks overhauled at the Greenfield, Mass., garage of the Division of Gypsy and Brown Tail Moths Control. That Division also furnished free winter storage for a number of our trucks at Greenfield, Mass., and Wilkes-Barre, Penna.

Every effort was made to keep automobile travel to a minimum consistent with conducting control work efficiently. To accomplish this, careful planning of field activities was essential. In one Vermont district, automobile travel was materially reduced by establishing a twelve-man camp in the town of Pownal on August 2nd. After completing work in this vicinity, the camp was moved to Norwich from which point control activities were conducted in that township and Hartford. Tents for this camp were obtained through the Vermont Forest Service and arrangements were made with local O.P.A. officials for the men to obtain adequate food ration coupons. One crew in the Stroudsburg, Pennsylvania district also maintained a camp of their own for several weeks during the 1944 season, and this arrangement also aided in reducing automobile travel in that state.

Injuries To Temporary Federal Employees

Although a total of 546 temporary workers were employed for 17,077 man days on Federal 3103 funds, only nine traumatic injuries, involving medical treatment under the provision of the Employees' Compensation Act, were sustained by such employees in three states during the calendar year 1944. Four of the cases were due to ivy or dogwood poisoning and the employees were disabled for only four to eight working days. In two other instances, leg injuries were sustained due to falls, and in one of these cases infection developed causing three weeks' disability. One employee in Vermont broke an ankle as a result of slipping on a large loose stone which rolled over his foot. This worker was disabled for more than four months. The other two cases during 1944 were eye injuries due to an insect bite and broken glasses.

State Compensation For Cultivated Ribes Destroyed During 1944

No compensation was paid for the 2,570 cultivated ribes destroyed in connection with control activities in this region during 1944.

Nursery Sanitation - 1944

Control work involving 126 man days labor was performed in the environs of 14 nurseries in Connecticut, New York, New Jersey and Pennsylvania during the current year, only 396 wild ribes and one cultivated bush being found and destroyed on the 7,390 acres in sanitation zones. All of this was rework except 117 acres in Connecticut where the zone around one nursery was extended. All of the work in Pennsylvania was performed by the blister rust control leaders. One of these employees also examined the environs of the state nursery at Washington Crossing, N.J., where no ribes were found even though no control work had been carried on there for several years. A total of 52,126,000 white pines were growing in the nurseries where protection work was conducted during 1944.

Table 9 summarizes the results of the 1944 nursery sanitation work by states, while Tables 38 to 41 in the Appendix indicate the accomplishments during the period 1930 - 1944 inclusive, by states and programs and the present status of such activities.

Table 9 - Nursery Sanitation Work During 1944
(All work conducted under Regular Cooperative Program)

State	No. Nurseries Worked	Est. Number White Pines in Nurseries Worked	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
					Wild & Cult.	Cult. Only		Man Days	Ribes
Conn.	4	1,704,000	Initial	117	240	0	37	.32	2.1
			Rework	963	114	0	60	.06	0.1
			Total	1,080	354	0	97	.09	0.3
N. Y.	3	46,697,000	All Rework	2,985	248	0	23	.01	0.03
N. J.	1	670,000	"	180	0	0	1	.01	0
Penna	6	2,055,000	"	3,145	35	1	5	.01	0.01
All States	14	52,126,000	Initial	117	240	0	37	.32	2.1
			Rework	7,273	397	1	89	.01	0.05
			Total	7,390	637	1	126	.02	0.09

Blister Rust Canker Elimination Work - 1944

Blister rust canker elimination work this year was restricted to one district in New York where a few laborers were employed for 72 man days to remove cankers from white pines in county-owned plantations and from ornamental trees on the state reservation at Saratoga Springs. A total of 14,900 white pines were examined and 360 fatally infected trees cut down. In addition, 372 branch and stem cankers were removed from 41 other infected pines.

Tables 46 and 47 in the Appendix summarize the results of all blister rust canker elimination work which has been performed in this region since 1932 by states, programs and land ownership classes.

Use of Aerial Photographs

Dr. Rusden, of our Division, conferred with representatives of several state and federal agencies as well as employees of the Harvard Forest and Brown Lumber Company in 1944 to obtain first-hand information on the use of aerial photographs on forestry work in an effort to determine the practicability of using such photographs on blister rust control. Additional information was also obtained from the Army and various other sources.

A few of the district leaders in this region have already made use of aerial photographs loaned or obtained from other agencies, and our Division purchased photographs of two counties in New Hampshire during 1944.

The subject was discussed in detail at the state leaders' conference in Cambridge, Mass. in November and as a result of the discussion, it was agreed that:

- (1) Increased use of aerial photographs on blister rust control work in the Northeastern States is desirable. Experience in their interpretation will increase their usefulness.
- (2) Variations in scale due to distortion near the edges of the photographs are not likely to be serious for the purpose of blister rust control.
- (3) Two copies of each photograph should be purchased, one for field use and one for the office. This will make copying by tracing, etc., unnecessary.
- (4) Due to complications in identifying locations of photographs, it does not appear advisable to cut the pictures up by road blocks. Depending upon the size of the prints obtained, it may be desirable to cut them into two or more pieces that would fit letter-size files, with the necessary photograph index numbers copied on each piece.
- (5) Photographs should be secured on a scale of 4 inches to one mile and on semi-gloss or double weight matte paper.

The regional leader recently compiled information showing the sections of the Northeastern Region which have been photographed by various agencies. Federal funds are available to purchase a number of aerial photographs for all of the states, except Rhode Island and New Jersey, where such pictures apparently will not be

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of much value on our project, especially in the former state due to the fact that the white pine occurs chiefly in mixture with hardwoods or as an understorey in such types. Orders will be placed as soon as possible for photographs of selected counties or portions of counties where they are most urgently needed in the other seven states. It is also planned to obtain free use of photographs from other agencies where possible.

Future Control Work on State and Privately-Owned Lands

In July, 1943 a detailed plan was prepared for a five year post-war blister rust control program in this region. The plan is based on the assumption that control activities would be continued at approximately the 1942 level for the duration and the post-war program would be put into effect July 1, 1945. However, present indications are that it will be a later date. All necessary mapping work would be completed during the first three years of the five year program. The proposed ribes eradication activities would complete the remaining initial work and all necessary second work, which would make it possible to place most of the control area on a maintenance basis.

At the end of 1944, detail mapping was still needed on 4,207,807 acres or 33.4% of all state and privately-owned lands in the present net control area. In addition, it will be necessary to examine all previously mapped merchantable pine areas to determine changes in pine stocking due to the 1938 and 1944 hurricanes, extensive cutting during war period, fires, etc., in order to make necessary changes on the original maps.

Initial control work was still needed on 1,771,772 acres of state and privately-owned lands at the end of 1944 and there are 5,962,593 acres which should be examined to determine the need for rework.

The following table lists detailed information by states on the detail mapping and ribes eradication work needed on state and privately-owned lands at the end of 1944.

Table 10 - Control Work Needed on State and Privately-Owned
Land As Of December 31, 1944

State	Total Acreage of Net Control Area	Acreage in Net Control Area In Need of			Percentage of Net Control Area In Need of		
		Detail Mapping	Initial Erad.	Exam- ination*	Detail Mapping	Initial Erad.	Exam- ination*
Maine	2,474,631	396,301	338,461	1,679,533	16.0	13.7	67.9
N. H.	3,136,173	1,706,724	278,875	1,949,664	54.4	8.9	62.2
Vt.	772,567	23,256	321,736	178,656	3.7	41.6	23.1
Mass.	1,784,689	902,434	33,401	633,727	50.6	1.9	35.5
R. I.	180,147	60,869	0	0	33.8	0	0
Conn.	495,225	0	0	9,451	0	0	1.9
N. Y.	2,913,459	962,931	563,860	1,076,256	33.1	19.4	36.9
N. J.	16,742	16,742	0	0	100.0	0	0
Penna.	806,591	133,500	235,439	435,306	16.6	29.2	54.0
All States	12,530,224	4,207,807	1,771,772	5,962,593	33.4	14.1	47.4

*To determine need for rework

The acreage of initial control work still to be done in New York includes 223,999 acres in scattered wood lots and plantations in the western part of the state outside the present districts. The protection work in this part of the state will probably be supervised by the state district foresters.

Expenditures For Project BLR-3-1

As indicated in Table 12, Federal 3103 expenditures during the calendar year 1944 totalled \$97,034.17 of which \$3,794.08 was expended for salaries of appointees; \$90,176.79 for wages of laborers, scouts and foremen; and \$3,062.50 for miscellaneous expenses, chiefly the operating costs of government-owned trucks used for crew transportations. Approximately 93% of all the Federal 3103 money was spent for wages of temporary personnel.

State and local cooperative expenditures and contributed services for Project BLR-3-1 totalled \$86,365.09 which is \$10,669.08 less than the total amount spent by the Federal Government. However, excluding the Federal 3103 expenditures for overtime pay which amounted to \$16,811.93, state and local cooperative expenditures and contributed services for Project BLR-3-1 in the region exceed Federal 3103 disbursements by \$6,182.85 during the calendar year 1944.

Under the provisions of the Lea Bill which was enacted on April 26, 1940, federal funds are made available for control work on state and private lands provided at least an equal amount shall have been appropriated, subscribed or contributed by state, county or local authorities or by individuals and organizations concerned. The first allotments of Federal 3103 money were made available in the fiscal year 1942. Table 11 gives a comparison of Federal 3103 expenditures and state and local cooperative expenditures and contributed services for Project BLR-3-1 during the fiscal years 1942 to 1944, inclusive, by states.

Table 11 - State and Local Cooperative Expenditures and Contributed Services For Project BLR-3-1 in Relation Federal 3103 Expenditures During Fiscal Years 1942-1944, Inclusive

State	State and Local Cooperative Expenditures and Contributed Services for Project BLR-3-1	Federal 3103 Expenditures		Excess or Deficit in State and Local Cooperative Expenditures and Contributed Services Over Federal 3103 Expenditures
		Total	Amount To Be Matched*	
Maine	\$36,141.18	\$33,846.67	\$30,217.10	+ \$5,924.08
N. H.	29,998.53	26,464.76	23,616.20	+ 6,382.33
Vt.	7,418.69	11,173.59	10,087.08	- 2,668.39
Mass.	18,539.97	17,561.00	15,691.62	+ 2,848.35
R. I.	8,452.02	3,834.65	3,501.05	+ 4,950.97
Conn.	15,566.96	10,578.76	9,387.67	+ 6,179.29
N. Y.	110,167.34	92,855.52	82,139.37	+ 28,028.47
Penna.	7,115.26	7,804.07	6,603.67	+ 511.59
All States	\$233,400.45	\$204,119.02	\$181,243.76	+\$52,156.69

*Excludes cost of overtime pay.

It is anticipated that the deficit of \$2,668.39 in Vermont will be made up by the end of the fiscal year 1945 due to the increased town cooperation in that State.

Table 12 - Total Expenditures and Contributed Services For Work Project BLR-3-1
During Calendar Year 1944

State and Local Cooperative Expenditures and Contributed Services									
State	Cash Expenditures				Value of Contributed Services		B.E. and P.Q. 3103.14	Grand Total	
	State Funds	Towns	Counties	Indiv.	County				
					State	County			
Maine	5,451.17	7,337.12	-	79.80	270.00	-	13,138.09	20,364.76	33,502.55
N. H.	6,404.97	3,588.14	-	15.50	1,428.13	-	11,436.74	11,422.96	22,859.70
Vt.	277.31	4,877.44	-	29.96	322.44	-	5,507.15	6,071.92	11,579.07
Mass.	5,240.74	162.02	-	559.36	534.00	-	6,496.12	7,729.50	14,225.62
R. I.	2,970.15	-	-	-	837.96	-	3,808.11	2,910.06	6,718.17
Conn.	4,570.76	470.00	-	34.80	249.96	-	5,325.52	1,971.08	7,296.60
N. Y.	16,126.31	1,252.00	10,380.66	74.88	5,379.96	1,156.25	34,370.06	39,847.78	74,217.84
Penna.	5,858.62	-	-	39.68	385.00	-	6,283.30	6,716.11	12,999.41
All States	46,900.03	17,686.72	10,380.66	833.98	9,407.45	1,156.25	86,365.09	97,034.17	183,399.26

Classification of B.E. and P.Q. 3103.14 Expenditures For Project BLR-3-1
During Calendar Year 1944

State	Salaries of Appointees			Wages of Laborers, Scouts and Foremen			Non-Labor Expenses	Total
	Base Pay	Overtime	Total	Base Pay	Overtime	Total		
Maine	-	-	-	15,783.50	3,516.05	19,299.55	1,065.21	20,364.76
N. H.	1,339.92	303.36	1,643.28	7,694.90	1,780.49	9,475.39	304.29	11,422.96
Vt.	-	-	-	4,674.50	1,015.78	5,690.28	381.64	6,071.92
Mass.	-	-	-	6,012.10	1,319.65	7,331.75	397.75	7,729.50
R. I.	1,299.96	-	1,299.96	1,276.80	254.78	1,531.58	78.52	2,910.06
Conn.	-	-	-	1,602.80	332.08	1,934.88	36.20	1,971.08
N. Y.	699.96	151.68	851.64	31,561.70	6,937.71	38,499.41	496.73	39,847.73
Penna.	-	-	-	5,213.60	1,200.35	6,413.95	302.16	6,716.11
All States	3,339.84	455.04	3,794.88	73,819.90	16,556.89	90,176.79	3,062.50	97,034.17

Table 13 - Status of B.E. and P.O. 3103.14 Funds For Fiscal Year 1945

State	Salaries of Appointees				Allotment For Fiscal Year	Letter of Allotment			Balance of Allotment on Jan. 1, 1945	Allotment For Fiscal Year	Expenditures From July 1 to December 31, 1944			Balance of Allotment on Jan. 1, 1945
	Expenditures From July 1 to December 31, 1944			Non-Labor Expenses		Total	Total							
	Base Pay	Over-time	Total											
								Base Pay			Overtime	Total		
Maine	-	-	-	-	-	17,357.00	10,539.20	2,347.68	542.98	13,429.86	3,927.14			
N. H.	-	-	-	-	-	12,179.00	7,694.90	1,780.49	229.81	9,705.20	2,473.80			
Vt.	-	-	-	-	-	7,528.00	3,145.60	684.46	252.09	4,082.15	3,445.85			
Mass.	-	-	-	-	-	7,503.00	4,075.70	900.37	232.09	5,203.16	2,294.84			
R. I.	1,300.00	649.98	-	649.98	650.02	1,951.00	777.60	155.18	41.71	974.49	976.51			
Conn.	-	-	-	-	-	4,203.00	1,223.60	256.43	-	1,480.03	2,722.97			
N. Y.	3,215.00	-	-	-	3,215.00	37,421.00	23,355.60	5,129.24	383.93	28,868.77	8,552.23			
Penna.	-	-	-	-	-	4,851.00	2,919.10	676.05	175.86	3,771.01	1,079.99			
All States	4,515.00	649.98	-	649.98	3,865.02	92,993.00	53,731.30	11,929.90	1,858.47	67,519.67	25,473.33			

PART IV

BLISTER RUST CONTROL WORK ON NATIONAL FORESTS - FINANCIAL PROJECT BLR-4

GENERAL STATEMENT

The U.S. Forest Service and the Bureau of Entomology and Plant Quarantine are cooperating in the control of white pine blister rust on the White Mountain and Allegheny National Forests in the Northeastern Region. However, control operations during the past two years have been restricted to the White Mountain National Forest in New Hampshire and Maine where a few experienced workers were employed by the Forest Service to make a survey of all the control areas and perform any necessary ribes eradication work. This project was under the technical supervision of District Blister Rust Control Leader Boomer, who is headquartered at North Conway, N. H.

In addition to these special control projects on the White Mountain and Allegheny National Forests, some ribes eradication work has been performed on the Green Mountain National Forest in Vermont. Most of this work was done in connection with regular cooperative control activities on state and privately-owned lands before this national forest was established. As a result of a conference between Supervisor Vessey and two of our Vermont leaders in 1944, action is being taken to determine the location of all white pine areas and the present status of control work on the forest. Some field survey work may be necessary to obtain all the desired information. Recommendations for future control work will be submitted to the Forest Service as soon as possible.

Results of 1944 Control Work on White Mountain National Forest

An experienced scout and two laborers were employed for 58 man days during the period May 22 to June 30, 1944 by the U.S. Forest Service to complete necessary ribes eradication work on eight federally-owned areas in New Hampshire and Maine which were surveyed in 1943.

A total of 3,892 wild currant and gooseberry bushes were destroyed on the 741 acres worked in 1944. The following summary lists the 1944 accomplishments for the areas in Maine and New Hampshire separately and by classes of work.

Table 14 - 1944 Ribes Eradication Work on White Mountain National Forest

State	Type of Work	Acreage Worked	No. Ribes Destroyed (All Wild)	Total Man Days	Total Cost	No. Ribes Per Acre	No. Acres Per Man Day
Maine	Initial	112	88	8	\$68.31	0.8	14.0
	Rework	386	1,470	9	74.90	3.8	42.9
	Total	498	1,558	17	143.21	3.1	29.3
N. H.	All Rework	243	2,334	41	349.11	9.6	5.9
Total	Initial	112	88	8	68.31	0.8	14.0
	Rework	629	3,804	50	424.01	6.0	12.6
	Total	741	3,892	58	\$492.32	5.3	12.8

The total cost of the 1944 control activities include \$308.80 for wages, \$172.50 for per diem allowance, and \$11.02 for transportation. These costs were paid by the Forest Service out of the balance of their \$1,000 allotment for the fiscal year 1944.

The present net control area on the White Mountain National Forest comprises 3,446 acres of which 1,087 acres is in white pine. All initial ribes eradication work has been completed and 96.7% of the control area has been worked twice. Third workings have also been performed on areas totalling 2,753 acres. As a result of all this work, there are now 2,402 acres, or 69.7% of the entire control area, on a maintenance basis.

No ribes eradication work will be needed on the White Mountain National Forest during the calendar year 1945, but District Leader Boomer recommends that the Gilead and Stoneham tracts in Maine be rechecked in the Spring of 1946. A detailed report of control work on this forest during 1944 was prepared by Mr. Boomer and copies distributed to the interested supervisory officials of the Forest Service.

Control Work on Allegheny National Forest

Allegheny National Forest officials submitted plans and budgets for blister rust control during the fiscal years 1943-1945, inclusive, but it was not possible to carry on any ribes eradication work due to the acute labor shortage in that vicinity.

During the period 1929 to 1942, control measures were applied on thirteen tracts aggregating 4,381 acres. Rework was also performed on 1,365 acres. Initial work is now needed on known areas totalling 1,786 acres, and it is estimated that protection work will be required on approximately four thousand acres of the large tract which was acquired from the Wheeler-Dusenbury Lumber Company during the fiscal year 1943. In addition, most of the areas which were protected several years ago, and which total 4,381 acres, should be examined at an early date to determine the need for rework. It is recommended that adequate funds be provided for control work on the Allegheny National Forest as soon as labor is available for such activities.

Table 15 - Ribes eradication work on National Forests, 1924-1944, inclusive

National Forest	Program	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
				Wild & Cult.	Cult. Only		Man Days	Ribes
White Mountain	Regular	Initial	6,391	182,581	-	562	.03	26.5
		Rework	8,517	19,038	-	339	.14	2.2
		Total	15,408	201,669	-	901	.06	13.1
	C.C.C.	Initial	1,950	633,866	85	2,325	1.19	325.1
		Rework	3,799	309,521	-	1,700	.45	81.5
		Total	5,749	943,387	85	4,025	.70	164.1
	All	Initial	8,841	816,447	85	2,887	.33	92.3
		Rework	12,316	328,609	-	2,039	.17	26.7
		Total	21,157	1,145,056	85	4,926	.23	54.1
Allegheny	Regular	Initial	891	129,027	8	194	.22	144.8
		Rework	881	21,691	-	152	.17	24.6
		Total	1,772	150,718	8	346	.20	85.1
	C.C.C.	Initial	3,490	641,827	22	2,432	.70	183.9
		Rework	525	41,068	-	435	.83	78.2
		Total	4,015	682,895	22	2,867	.71	170.0
	All	Initial	4,381	770,854	30	2,626	.60	176.0
		Rework	1,406	62,759	-	587	.42	44.6
		Total	5,787	833,613	30	3,213	.56	144.0
Total	Regular	Initial	7,782	311,608	8	756	.10	40.0
		Rework	9,398	40,779	-	491	.05	4.3
		Total	17,180	352,387	8	1,247	.07	20.5
	C.C.C.	Initial	5,440	1,275,693	107	4,757	.87	234.5
		Rework	4,324	350,589	-	2,135	.49	81.1
		Total	9,764	1,626,282	107	6,892	.71	166.6
	All	Initial	13,222	1,587,301	115	5,513	.42	120.0
		Rework	13,722	391,368	-	2,626	.19	28.5
		Total	26,944	1,978,669	115	8,139	.30	73.4

Table 15 lists the gross acreages reported worked on White Mountain and Allegheny National Forest lands during the period 1924-1944, inclusive. However, several tracts on the White Mountain National Forest, which had been examined for ribes during previous years, were discontinued from the control area in 1943 by the local Forest Service officials. As a result, the white pine areas where blister rust control will be maintained now coincide with the management plans

for this forest. Mr. Boomer's report gives a detailed explanation of the reasons for discontinuing various units from the control area.

Table 16 - Status of Ribes Eradication Work in Present Net Control Areas on National Forests
December 31, 1944

National Forest	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Acreage Worked			Acreage Initial Work Still to Be Done	Acreage Now on Main-tenance Basis	Percentages		
				First Work	Second Work	Other Work-ings			Worked Once	Worked Twice	On Main-tenance
White Mtn.	Maine	498	160	498	386	386	0	111	100.0	77.5	23.1
	N.H.	2,948	927	2,948	2,948	2,367	0	2,402	100.0	100.0	81.5
	Total	3,446	1,087	3,446	3,334	2,753	0	2,513	100.0	96.7	72.9
Allegheny		6,167	1,191	4,381	4,381	904	502	1,786*	0	71.0	14.7
Total		9,613	2,278	7,827	7,827	4,233	3,255	1,786	2,513	81.4	24.1

*It is estimated that protection measures will be required on an additional four thousand acres of the large tract acquired from the Wheeler-Dusenbury Lumber Company during the fiscal year 1943.

Table 17 - Expenditures For Blister Rust Control on National Forests
1924-1944, Inclusive

Agency	White Mountain National Forest	Allegheny National Forest	Total
Forest Service	\$3,701.00	\$1,009.77	\$4,710.77
Bureau of Plant Industry	75.63	207.55	283.18
State of New Hampshire	357.61	-	357.61
C. C. C.	8,096.47	4,984.02	13,080.49
Total	\$12,230.71	\$6,201.64	\$18,432.35

The costs listed in Table 17 do not include any charges for the supervisory activities of employees of the Forest Service, Bureau of Plant Industry, and the Bureau of Entomology and Plant Quarantine. The C.C.C. costs were computed on the arbitrary basis of \$1.00 per eight-hour man day for the time the enlisted men spent on the project plus 35 cents per day for subsistence in 1933, 40 cents in 1934, and 50 cents during the period 1935 to 1939, inclusive. C.C.C. expenditures also include the actual cost of technical foremen assigned to the project and estimated costs of transportation for the entire C.C.C. personnel.

PART VBLISTER RUST CONTROL ON NATIONAL PARKS - FINANCIAL PROJECT BLR-5GENERAL STATEMENT

The National Park Service and the Bureau of Entomology and Plant Quarantine are cooperating in the application of blister rust control measures on lands, under the jurisdiction of the former agency in the Northeastern Region, involving projects at Acadia National Park on Mount Desert Island in Maine and the Hickory Run Recreational Demonstration Area in Carbon County, Pennsylvania. Ribes eradication work has also been performed on several other recreational demonstration areas chiefly in connection with the regular cooperative control work prior to the time the Federal Government acquired these tracts which are now being transferred to the states concerned. The results of any control work on recreational demonstration areas, with the exception of the Hickory Run tract in Pennsylvania, are included in reports of accomplishments on state and privately-owned lands in this region.

During 1944, control activities were restricted to Acadia National Park where two checkers and six local high school boys were assigned to post checking and ribes eradication work from May 16 to August 30. State blister rust control leader Fatzinger, of Pennsylvania, conferred with Mr. Heinrich, of the National Park Service, at Hopewell on April 18th and obtained the latter's approval of proposed reductions in the control area at Hickory Run based on a survey made in the Fall of 1943. Messrs. Fatzinger and Wright of our Bureau also made another inspection of this recreational demonstration area on May 17th, but no ribes eradication work was performed on the tract during the current year.

ACADIA NATIONAL PARK PROJECT

White pine is of special importance from a scenic and recreational viewpoint at Acadia National Park where control operations have been in progress since 1929. Blister rust infection was generally established throughout the pine areas on this park before the control program was initiated in 1929, but the ribes eradication work since that time has been very effective in controlling this destructive disease. Field studies and general observations have shown that little or no new infection has occurred on the white pines after the areas were cleared of ribes. However, numerous diseased pines with cankers which originated prior to the application of control measures can be found throughout the park.

Initial ribes eradication work has been completed on all present and prospective Acadia Park lands and nearly 60% of the present net control area, comprising 16,866 acres, has been worked twice. During 1944, third work was also performed on 2,626 acres. As a result of all this ribes eradication work and the post checking activities since 1941, there are 14,700 acres in the control area, or over 87%, now on a maintenance basis. The remaining 13% undoubtedly can be placed in this category after another season's work.

Messrs. Stimson and Bradbury of our Bureau conferred with Superintendent Hadley at Bar Harbor in December and at that time a decision was made as to the portions of Mount Desert Island which would be included in the permanent blister

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rust control area on Acadia National Park. As a result, the total control area was reduced from 20,450 to 16,366 acres and the permanent control records and maps have been revised accordingly. Control will be maintained on the units outside the park through state and local cooperation. Arrangements have also been made for District Leader Bradbury, who is headquartered at Belfast, Maine, to supervise all future control activities on the park. The regional office at Cambridge will, however, continue to furnish technical direction to the project.

Control Activities During Calendar Year 1944

Two freshmen from the New York State College of Forestry were employed as checkers on the Acadia Park project starting May 16, 1944. These employees were assigned to post checking until June 5th when the services of six local high school boys were obtained for ribes eradication work. Several of the boys worked on the project during 1943 which simplified the training problem.

Very few ribes were found in the areas surveyed by the checkers during the period May 16 to June 4 and no crew work was necessary on these tracts, all of which were placed on maintenance. Beginning June 5th, each of the checkers was assigned a three-man unit and the areas subsequently worked were covered by crew methods, but in many instances it was possible to use wide spacing. This procedure in many ways is more effective than the post checking method whereby strips are run at regular five or ten chain intervals across an area to determine ribes conditions. If many ribes are located on the strip line surveys, it is sometimes very difficult to determine the exact portion of the area which requires crew work. By using small crews in scout formation, all likely ribes sites are examined and any bushes encountered are removed at the same time. Rapid coverage is possible when the work is performed by experienced personnel. An average of 6.8 acres per man day were covered on the 1944 crew work at Acadia Park. This production rate undoubtedly would have been higher if experienced foremen had been available to direct the crew activities. The services of the two checkers employed in 1944 were not entirely satisfactory, chiefly due to their youth and lack of blister rust control experience as well as experience in supervisory work. Tentative arrangements have been made to employ an experienced foreman on the project in 1945.

District Leader Bradbury assisted in training the crews in June and made several visits to Acadia Park during the season to inspect control activities. Messrs. Filler and Stimson of the Cambridge, Mass. regional office of our Division also conferred with the local Park Service officials on a few occasions and inspected field operations in connection with technical supervision of the project.

Post Checking Work During 1944

The procedure used on the 1944 post checking work was the same as that followed during the preceding three years. Parallel strip checks, a half rod or a rod wide, were run by use of a box compass in cardinal directions at five to ten chain intervals throughout each block unit. In addition, offsets were made in especially favorable ribes sites and measured general checks were made along all roadsides. Distances were measured by pacing and data were recorded on the location, number and live stem of all ribes found.

All of the areas post checked during 1944 had been previously covered twice by crews, but no control work had been performed on these tracts for at least five

years. A 7.13% check was made of five areas totaling 2,338 acres and only 71 ribes with 107 feet of live stem were found and removed as a result of 184 man hours checking. In addition, 52 seedlings were located, but these were not included in the ribes count. As indicated in Table 18, less than one ribes bush per acre was found in each of the five areas examined and the maximum live stem per acre was 1.3 feet in Block 35c. No further ribes eradication work will be needed in these blocks for many years unless there is some unusual disturbance of the forest floor which would cause germination of dormant ribes seeds. All of the units post checked in 1944 as well as those worked by the crews this year were placed on maintenance.

Table 18 - Results of 1944 Post Checking Work at Acadia National Park

Block No.	Total Acreage of Block	Acreage of Check Strips	% Checked	Ribes Found on Checks		No. Ribes Per Acre on Checks	F.L.S. of Ribes Per Acre on Checks	No. Seedlings Found on Checks	Acreage in Need of Rework	Man Hours Spent on Checks
				No.	F.L.S.					
34	512	22.4	4.37	5	15	0.2	0.7	0	0	34
35A	331	30.7	9.27	3	3	0.1	0.1	0	0	33
35B	635	47.1	7.42	15	16	0.3	0.3	11	0	45
35C	573	49.5	8.64	43	64	0.9	1.3	40	0	50
37C	287	16.9	5.89	5	9	0.3	0.5	1	0	22
Total	2,338	166.6	7.13	71	107	0.4	0.6	52	0	184

Table 19 - Results of Post Checking Work During Period 1941 to 1944, Inclusive

Year	Total Acreage of Blocks Checked	Total Acreage Checked	% Checked	Total Acreage in Need of Rework	% in Need of Rework	Ribes Found on Checks		Ave. Per Acre		No. Seedlings Found on Checks*	Total Man Hour Checking
						Total Number	Total Live Stem (In feet)	No. Ribes	F.L.S. of Ribes		
1941	7,643	313.3	4.1	551	7.2	277	816	0.9	2.6	119	592
1942	6,544	464.5	7.1	1,092	16.7	777	2,400	1.7	5.2	873	751
1943	656	31.9	4.9	0	0	1	1	0.03	0.03	0	54
1944	2,338	166.6	7.1	0	0	71	107	0.4	0.6	52	184
Total	17,181	976.3	5.7	1,643	9.6	1,126	3,324	1.2	3.4	1,044	1,581

*Excluded in other ribes data in this summary.

As indicated in Table 19, systematic strip line checks have been made in control areas totalling 17,151 acres since 1941 to determine the need for ribes rework. Some of these areas (chiefly on west side of Somes Sound) were discontinued from the permanent control area on Acadia National Park when this matter was discussed with Superintendent Hadley in December 1944. These areas had been considered potential park lands, but they have not been acquired by the Government and future control work in these tracts will be performed in connection with the regular cooperative program with towns on Mount Desert Island.

The F.L.S. per acre values listed in Table 19 indicate an average of 3.4 feet of ribes live stem was found on the strip checks in all of the areas surveyed during the period 1941-1944, inclusive. However, the checks in 1941 and 1942 showed that in certain portions, totalling 1,643 acres, the amount of ribes regrowth was sufficient to necessitate rework. The checks in these particular sites during 1941 and 1942 showed an average of 22.0 feet and 19.6 feet of ribes live stem per acre, respectively. The 1,643 acres where rework was found to be necessary represents only 9.6% of total acreage of all the units surveyed since 1941. Due to minor adjustments in the boundaries of three blocks, the total acreage requiring rework was reduced to 1,609 acres when the necessary ribes eradication work was performed in 1943.

Ribes Eradication Work During 1944

The two checkers and six local high school boys were assigned to ribes eradication work at Acadia Park beginning June 5th. Two four-man units were used to cover the areas in strip formation, the spacing of the men in line being varied in accordance with the density of undergrowth, topography, abundance of ribes, etc. In many instances, it was possible to use wide spacing as few ribes were encountered in many sections of the units examined in 1944. The two checkers resigned on August 19th, and during the balance of the month a six-man crew was used with one of the high school boys functioning as foreman.

Only 2,515 ribes were located and destroyed on the five units, comprising 2,671 acres, which were examined as a result of 392 man days labor by the two crews assigned to the project during the period June 5 to August 30, 1944. All of this was third working except 45 acres of second work in Block 43. Table 20 summarizes the results of the 1944 ribes eradication work by block units.

Table 20 - Ribes Eradication Work at Acadia National Park During 1944

Block No.	Acreage Worked			No. Ribes Destroyed (All Wild)	Total Man Days	Acres Per Man Day	Ribes Per Acre
	2nd Work	3rd Work	Total				
37-B	-	198	198	107	18	11.0	0.5
40	-	206	206	438	55	3.7	2.1
42	-	835	835	1,218	174	4.8	1.5
43	45	1,152	1,197	383	95	12.6	0.3
44	-	235	235	369	50	4.7	1.6
Total	45	2,626	2,671	2,515	392	6.8	0.3

The production rate ranged from 3.7 acres in Block 40 to 12.6 acres per man in Block 43 and averaged 6.5 acres for all of the 1944 work. The time required to do ribes eradication work on Acadia National Park now depends chiefly on the topography, density of undergrowth, ability and experience of the personnel employed as the ribes population in the control areas has been reduced to a point where they are a minor factor in the production rate. Although an average of less than one bush per acre was found on the areas worked by the crews in 1944, there were many locations containing small concentrations of bushes. As indicated in Table 20, the production rate was lowest in the units having the greater number of ribes per acre. However, this is primarily due to the rugged topography in many sections of Blocks 40, 42 and 44.

Table 21 - Ribes Eradication Work at Acadia National Park
1929-1944, Inclusive

Program	Type of Work	Gross Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild & Cult.	Cult. Only		Man Days	Ribes
Regular	Initial	7,726	503,920	-	2,798	.36	65.2
	Rework	4,503	23,294	1	918	.20	5.2
	Total	12,234	527,214	1	3,716	.30	43.1
S.C.C.	Initial	12,990	390,020	293	8,429	.65	30.0
	Rework	9,427	35,191	-	3,564	.38	3.7
	Total	22,417	425,211	293	11,993	.53	19.0
44	Initial	20,716	893,940	293	11,227	.54	43.2
	Rework	13,935	58,435	1	4,482	.32	4.2
	Total	34,651	952,425	294	15,709	.45	27.5

Blister Rust Canker Elimination Work

No blister rust canker elimination work has been performed at Acadia National Park since 1939. Such treatment was given the pines along many of the important roads and trails during the period 1932-1939, inclusive, and several thousand valuable scenic trees were saved from destruction by the rust. However, follow-up work is now needed in these areas to remove the infections which were not readily apparent at the time of the initial treatment. Based on a survey made in 1942, there are several other sections where blister rust canker elimination work is urgently needed as soon as labor is available for such activities.

Table 23 summarizes the results of all canker elimination work during the period 1932 to 1939, inclusive.

Table 22 - Blister Rust Canker Elimination Work At Acadia National Park
(Work performed during period 1932-1939, inclusive)

Program	Total No. Pines Examined	No. Infected Pines Cut Down	No. Infected Pines From Which Cankers Removed	No. Cankers Removed		Total Men Days
				Branch	Stem	
Regular	2,546	319	715	1,480	61	100
C. C. C.	58,261	2,957	8,379	27,054	2,691	2,117
Total	60,807	3,276	9,594	28,534	2,752	2,217

Table 23
Expenditures For Blister Rust Control Work At Acadia National Park

Calendar Year 1944

Salaries of Checkers

Wages of Laborers

Period	Salaries of Checkers			Wages of Laborers			Misc.	Total
	Base Pay	Overtime	Total	Base Pay	Overtime	Total	Expenses	
May 16-June 30	450.00	97.50	547.50	339.00	73.19	412.19	12.64	972.33
July 1-August 30	570.11	123.53	693.64	849.50	183.47	1,032.97	10.06	1,736.67
Total	1,020.11	221.03	1,241.14	1,188.50	256.66	1,445.16	22.70	2,709.00

Calendar Years 1929-1944, Inclusive

	Amount
National Park Service	\$16,885.05
Bureau of Plant Industry	3,145.83
C. C. C.	29,880.35
Total	\$49,911.24

The costs for the control project at Acadia National Park do not include any charges for the supervisory activities of employees of the Bureau of Plant Industry or Bureau of Entomology and Plant Quarantine. The C.C.C. costs were computed on the basis of an arbitrary charge of \$1.00 per eight-hour man day for the time the enlisted men spent on the project plus 35 cents per day for subsistence in 1933, 40 cents in 1934, and 50 cents during the period 1935-1942, inclusive. The C.C.C. expenditures also include the actual cost of technical foremen and checkers assigned to the project, and estimated cost of transportation for all C.C.C. personnel while on blister rust control work.

Proposed Control Work During Calendar Year 1945

There is a balance of \$1663.33 in the fiscal year 1945 allotment available for control work during May and June, 1945. An allotment of \$2278.00 has been recommended for the fiscal year 1946, which is a decrease of \$1122.00 as compared with the allotment for the current fiscal year.

Tentative arrangements have been made to employ Mr. L. M. Hastings as a checker on the control project during 1945. Mr. Hastings has had several years' experience

Blister rust control work was employed on the pest checking project at Acadia Park during the seasons of 1941 and 1942. His services were very satisfactory. It is also planned to employ a five-man crew to perform any necessary ribes eradication work under the direction of Mr. Hastings. Present indications are that it will again be necessary to rely on local high school boys for labor, in which case their services will not be available until early in June. With proper supervision these boys can produce very satisfactory results. In fact, youths 16-21 years of age are preferable to older men in working areas with rugged topography such as we frequently encountered at Acadia Park.

At the present time, there are areas totalling 1,952 acres which should be examined to ascertain the need for rework. No ribes eradication has been performed on these tracts for at least five years. There are also a few hundred acres worked since 1939 which need examination to determine if they can be placed on maintenance. By the end of the 1945 season, all of the control area should be on a maintenance basis and danger from blister rust will be negligible for an indefinite period. This safe condition can be maintained in the future by periodic examinations to locate any sites where the ribes regrowth has reached a stage where it again is a menace to the pines. In most instances, it should be possible to do the necessary ribes eradication work by scouting methods preferably by use of small crews.

There is a possibility that the areas scheduled for examination during 1945 will be completed before the end of the season. If so, it is recommended that the entire personnel be assigned to blister rust canker elimination work after completing the ribes eradication activities.

HICKORY RUN RECREATIONAL DEMONSTRATION AREA

During the period 1937-1939, inclusive, the National Park Service conducted ribes eradication work on 4,800 acres of the Hickory Run Recreational Demonstration Area in Carbon County, Pennsylvania. A total of 75,000 wild ribes were destroyed as a result of 1,318 man days labor by employees assigned to the project at a cost of \$5,598.08.

As a result of a survey made by Blister Rust Control Leaders Fatzinger and McDonalds during 1943 and approved by Mr. Heinrich of the National Park Service in 1944, areas totalling 800 acres and containing about 280 acres of white pine will be retained in the permanent control area at Hickory Run. It is recommended that the entire area of 800 acres be reworked as soon as practicable.

Table 24 - Status of River Application Work on National Game Areas
December 31, 1944

	Acadia National Park	Hinkow Run Recreational Area	Total
Acreage of net control area.....	16,866	500	17,366
Acreage of white pine in net control area.....	3,200	280	3,480
Acreage worked in net control area:			
First work.....	16,866	500	17,366
Second work.....	10,022	0	10,022
Third work.....	2,626	0	2,626
Acreage now on maintenance basis.....	14,700	0	14,700
Acreage now requiring examination to determine need for rework.....	2,166	500	2,666
Percentage of net control area:			
Worked once.....	100.0	100.0	100.0
Worked twice.....	59.4	0	59.4
Worked three times.....	15.6	0	15.6
On maintenance.....	87.2	0	87.2
Now in need of examination.....	12.8	100.0	112.8

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Table 25 - Informational and Service Activities of Permanent and Temporary District Leaders During Period 1923-1944, Inclusive

Informational Activities

State	Meetings Addressed		Items Published	Displays Placed
	Number	Attendance		
Maine	1,365	37,489	601	1,060
N. H.	3,493	204,700	4,271	2,110
Vt.	984	33,126	640	856
Mass.	1,031	46,053	2,166	869
R. I.	255	19,710	408	132
Conn.	106	3,969	645	142
N. Y.	1,921	149,110	2,763	791
Penna.	33	3,520	33	55
All States	9,188	497,677	11,527	6,015

Service Activities

State	Initial Interviews	Follow-up Calls	Persons Instructed in Field
Maine	32,970	11,965	21,683
N. H.	38,542	37,408	21,544
Vt.	14,979	10,418	10,307
Mass.	35,228	13,210	12,476
R. I.	3,770	3,176	712
Conn.	4,474	3,380	1,654
N. Y.	34,244	25,186	24,031
Penna.	1,851	384	1,648
All States	166,058	105,127	94,055

Table 26 - Local Cooperation on Blister Rust Control Work During 1944

State	Individual Cooperation			Town Cooperation			County Cooperation				Value of Additional Contributions of Services
	No. Cooperators (All on Ribes Eradication)	Amount Spent By Individual Cooperators*	Appropriations		No. Contributions	Amount Town Money Expended	Appropriations				
			No.	Amount			No.	Amount Approp.	Amount Expended		
Maine	1	79.80	55	9,972.00	-	7,337.12	-	-	-	-	
N. H.	1	15.50	20	4,915.00	-	3,588.14	-	-	-	-	
Vt.	2	29.96	25	5,350.00	-	4,877.44	-	-	-	-	
Mass.	41	559.36	-	-	4	162.02	-	-	-	-	
Conn.	2	34.80	17	3,563.00	-	470.00	-	-	-	-	
N. Y.	5	74.83	8	2,900.00	-	1,252.00	9	11,345.00	10,380.66	1,156.25	
Penna.	1	39.68	-	-	-	-	-	-	-	-	
All States	53	833.98	125	26,700.00	4	17,686.72	9	11,345.00	10,380.66	1,156.25	

*Includes items for value of cultivated ribes destroyed during period January 1 to June 30, 1944 in Maine and Massachusetts in the amounts of \$30.20 and \$64.60, respectively.

Table 27 - Local Cooperation on Blister Rust Control Work, 1918-1944, Inclusive

State	Individual Cooperation			Town Cooperation			County Cooperation	
	No. Cooperators		Amount Spent By Individual Cooperators	No. Town		Amount Town Money Expended	No. County Allotments or Appropriations	Amount Spent by Counties
	Ribes Erad.	Canker Elimination		Appropriations	Contributions			
Maine	11,104	24	85,349.98	896	20	148,621.54	-	-
N. H.	693	-	49,031.17	1,471	20	440,269.43	6	1,724.08
Vt.	2,351	12	75,032.74	51	64	31,015.05	-	-
Mass.	21,823	-	102,165.14	4	56	24,118.64	-	-
R. I.	8	-	581.36	-	-	-	-	-
Conn.	508	-	9,988.99	72	51	28,267.45	-	-
N. Y.	5,974	1	174,534.53	23	3	7,986.12	68	70,804.34
Penns.	303	-	2,273.36	-	-	-	-	-
All States	42,761	37	498,957.27	2,517	214	650,253.23	74	72,566.46

Table 28- Control Area Mapping Work During 1944
(All work on state and private lands)

State	Acreage Mapped	Acreage Examined But Not Mapped	Total Man Days
I.H.	13,002	19,694	420
Mass.	11,934	7,744	34
R.I.	4,639	4,763	72
N.Y.	24,915	26,990	448
Penna.	10,449	2,000	21
All States	64,939	61,191	995

All of the 1944 mapping work was performed under the Regular Cooperative Program.

Table 29- Control Area Mapping During Period 1933-1944, Inclusive
By States

State	Total Acreage Reported Mapped*	Acreage Detail Mapped in Net Control Area	Acreage Examined But Not Mapped	Miles Control Area Boundary Lines Painted	Total Man Days
Mass.	2,289,913	2,078,828	4,762,969	1,808 1/2	37,476
R.I.	1,494,203	1,432,327	279,396	-	41,378
N.Y.	1,664,961	744,311	4,010,625	828	23,151
Penn.	986,126	882,205	1,216,850	1,290	20,803
I.H.	235,034	119,278	9,131	-	2,399
Conn.	732,019	495,225	2,639,160	3,202 1/4	25,203
N.Y.	4,312,734	1,950,528	2,935,904	2,399	44,563
Penn.	812,755	673,091	2,000**	7,369	45,204
All States	12,527,745	8,375,863	15,856,035	16,896 3/4	240,177

*This acreage includes a large amount of re-mapping especially in Vermont, Connecticut and New York. It also includes areas which were mapped and subsequently discontinued from the control area.

**Several hundred thousand additional acres of non-pine land were also examined but not mapped in Pennsylvania but no record was kept of this acreage.

Table 30 - Control Area Mapping Work During Period 1933-1944, Inclusive
By Programs

Program	Total Acreage Reported Mapped	Acreage Examined But Not Mapped	Miles Control Area Boundary Lines Painted	Total Man Days
Regular Cooperative	627,951	798,688	-	4,200
C.C.C.	999,838	364,002	2,630	38,205
P.W.A.	744,663	942,528	227	6,215
A.P.A. (F.A.)	9,239,070	11,177,457	10,678 1/2	152,264
A.P.A. (State)	656,491	399,852	3,361 1/4	26,676
E.R.A.	213,971	2,139,370	-	4,205
C.V.A.	45,761	34,138	-	592
All Programs	12,527,745	15,856,035	16,896 3/4	240,177

Table 31 - Status of Control Area Mapping Work - December 31, 1944

State	Total Acreage of Net Control Area	Acreage Detail Mapped in Net Control Area	% Net Control Area Detail Mapped
Maine	2,491,995	2,078,828	83.4
N.H.	3,139,121	1,432,397	45.6
Vt.	772,567	744,311	96.3
Mass.	1,784,689	882,205	49.4
R.I.	180,147	119,278	66.2
Conn.	495,225	495,225	100.0
N.Y.	2,913,459	1,950,528	66.9
N.J.	16,742	0	0
Penna.	813,553	673,091	82.7
All States	12,607,503	8,375,863	66.4

Table 32 - Ribes Eradication Work During 1942 by State and Land Ownership Classes
(All work conducted under Regular Cooperative Program)

State	Land Ownership Class	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
				Wild and Cult.	Cult. Only		Ribes	Man Days	
	State and Private	Initial	23,046	324,831	186	2,038	14.1	.09	11.3
		Rework	50,475	529,790	78	3,934	10.5	.08	12.8
		Total	73,521	854,621	264	5,972	11.6	.08	12.3
Maine	Acadia National Park	All							
		Rework	2,671	2,515	-	392	0.9	.15	6.8
		Total							
	White Mt. National Forest	Initial	112	88	-	8	0.8	.07	14.0
		Rework	386	1,470	-	9	3.8	.02	42.9
		Total	498	1,558	-	17	3.1	.03	29.3
	Total	Initial	23,158	324,919	186	2,046	14.0	.09	11.3
		Rework	53,532	533,775	78	4,335	10.0	.08	12.3
		Total	76,690	858,694	264	6,381	11.2	.08	12.0
N.H.	State and Private	Initial	5,812	85,561	20	872	14.7	.15	6.7
		Rework	14,427	196,721	-	2,372	13.6	.16	6.1
		Total	20,239	282,282	20	3,244	13.9	.16	6.2
	White Mt. Nat. Forest	All							
		Rework	243	2,334	-	41	9.6	.19	5.9
		Total							
	Total	Initial	5,812	85,561	20	872	14.7	.15	6.7
		Rework	14,670	199,055	-	2,413	13.6	.16	6.1
		Total	20,482	284,616	20	3,285	13.9	.16	6.2
Vt.	All State and Private	Initial	9,210	71,925	26	989	7.8	.11	9.3
		Rework	8,687	98,226	2	1,265	11.3	.15	6.9
		Total	17,897	170,151	28	2,254	9.5	.13	7.9
Mass.	"	Initial	7,749	10,749	49	313	1.4	.04	24.8
		Rework	35,635	77,633	476	2,089	2.2	.06	17.1
		Total	43,384	88,382	525	2,402	2.0	.06	18.1
N.J.	"	Initial	703	0	-	38	0	.05	18.5
		Rework	4,962	3,332	-	462	0.7	.09	10.7
		Total	5,665	3,332	-	500	0.6	.09	11.3
Conn.	"	Initial	1,005	388	-	51	0.4	.05	19.7
		Rework	24,265	50,218	-	600	2.1	.02	40.4
		Total	25,270	50,606	-	651	2.0	.03	38.8
N.Y.	"	Initial	37,413	379,468	135	2,902	10.1	.08	12.9
		Rework	164,989	472,246	969	8,575	2.9	.05	19.2
		Total	202,402	851,714	1,104	11,477	4.2	.06	17.6
Penn.	"	Initial	13,609	126,371	591	1,686	9.3	.12	8.1
		Rework	8,701	57,295	37	787	6.6	.09	11.1
		Total	22,310	183,666	628	2,473	8.2	.11	9.0
All States	State and Private	Initial	98,547	999,293	1,007	8,889	10.1	.09	11.1
		Rework	312,141	1,485,461	1,562	20,084	4.8	.06	15.5
		Total	410,688	2,484,754	2,569	28,973	6.1	.07	14.2
	National Parks	All							
		Rework	2,671	2,515	-	392	0.9	.15	6.8
		Total							
	National Forests	Initial	112	88	-	8	0.8	.07	14.0
		Rework	629	3,804	-	50	6.0	.08	12.0
		Total	741	3,892	-	58	5.3	.08	12.8
	Total	Initial	98,659	999,381	1,007	8,897	10.1	.09	11.1
		Rework	315,441	1,491,760	1,562	20,526	4.7	.065	15.4
		Total	414,100	2,491,161	2,569	29,423	6.0	.07	14.1

Table 33 - Ribes Eradication Work, 1913-1944, Inclusive
By States

State	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild & Cult.	Cult. Only		Man Days	Ribes
Maine	Initial	2,391,281	46,387,181	138,117	255,310	.11	19.4
	Rework	856,872	13,160,582	14,913	142,387	.17	15.4
	Total	3,248,153	59,547,763	153,030	397,697	.12	18.3
N.H.	Initial	3,188,312	56,760,568	152,664	300,559	.09	17.6
	Rework	953,764	12,258,089	6,260	116,162	.12	12.9
	Total	4,142,076	69,018,657	158,924	416,721	.10	16.7
Vt.	Initial	509,788	11,856,205	15,731	120,916	.24	23.3
	Rework	168,752	2,888,875	2,227	45,009	.27	17.1
	Total	678,540	14,745,080	17,958	165,925	.24	21.7
Mass.	Initial	2,042,257	16,820,168	258,024	129,211	.06	8.2
	Rework	1,135,160	5,915,171	25,427	94,027	.08	5.2
	Total	3,177,417	22,735,339	283,451	223,238	.07	7.2
R.I.	Initial	330,050	269,502	13,689	21,251	.06	0.8
	Rework	322,359	381,002	10,008	54,840	.17	1.2
	Total	652,409	650,504	23,697	76,091	.12	1.0
Conn.	Initial	444,293	2,496,108	29,317	39,773	.09	5.6
	Rework	504,144	4,947,168	10,362	95,266	.19	9.4
	Total	948,437	7,443,276	39,679	135,039	.14	7.8
N.Y.	Initial	2,620,503	63,043,999	125,260	696,515	.27	24.1
	Rework	1,229,535	11,078,670	14,971	197,539	.16	9.0
	Total	3,850,038	74,122,669	140,231	894,054	.23	19.3
N.J.	Initial	16,742	49,493	1,713	1,324	.08	3.0
	Rework	1,417	16,971	15	392	.28	12.0
	Total	18,159	66,464	1,728	1,716	.09	3.7
Penna.	Initial	636,018	33,089,858	52,252	322,834	.51	52.0
	Rework	243,339	5,660,305	3,158	157,990	.65	23.3
	Total	879,357	38,750,163	55,410	480,824	.55	44.1
All States	Initial	12,179,244	230,773,082	786,767	1,887,693	.15	18.9
	Rework	5,415,342	56,306,833	87,341	903,612	.17	10.4
	Total	17,594,586	287,079,915	874,108	2,791,305	.16	16.3

The data for Table 33 were compiled from the state leaders' annual statistical reports. In 1937 and 1942, certain adjustments were made in the acreage figures for Maine, Vermont and Connecticut in order to make the data agree with the permanent CO-105 records. The details of these adjustments are given on Page 78 of the 1942 annual report for the Northeastern Region.

Table 34 - Ribes Eradication Work, 1916-1944, Inclusive

By Programs

Program	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild & Cult.	Cult. Only		Man Days	Ribes
Regular Cooperative	Initial	8,510,824	106,470,022	613,438	684,506	.08	12.5
	Rework	2,431,016	13,466,884	27,854	155,678	.06	5.5
	Total	10,941,840	119,936,906	641,292	840,184	.08	11.0
G.C.C.	Initial	1,380,051	49,871,577	75,026	684,302	.50	36.1
	Rework	1,200,463	16,684,840	18,368	453,609	.38	13.9
	Total	2,580,514	66,556,417	93,394	1,137,911	.44	25.8
S.C.S.	Initial	20,451	651,804	360	9,944	.49	31.9
	Rework	10,120	18,830	-	2,485	.25	1.9
	Total	30,571	670,634	360	12,429	.41	21.9
N.P.A. (F.A.)	Initial	1,927,319	64,062,297	85,141	455,305	.24	33.2
	Rework	1,479,148	23,786,417	32,843	258,265	.17	16.1
	Total	3,406,467	87,848,714	117,984	713,570	.21	25.8
W.P.A. (State)	Initial	90,665	1,757,703	2,892	11,827	.13	19.4
	Rework	154,784	797,288	2,427	13,310	.09	5.2
	Total	245,449	2,554,991	5,319	25,137	.10	10.4
P.W.A.	Initial	179,970	7,646,550	7,297	33,419	.19	42.5
	Rework	162,541	1,373,778	5,379	16,156	.10	8.5
	Total	342,511	9,020,328	12,676	49,575	.14	26.3
C.W.A. and E.P.A.	Initial	20,547	175,737	1,600	4,500	.22	8.6
	Rework	7,704	158,892	306	3,270	.42	20.6
	Total	28,251	334,629	1,906	7,770	.28	11.8
A.B.A.	Initial	10,639	113,439	948	3,564	.33	10.7
	Rework	5,714	13,889	110	772	.14	2.4
	Total	16,353	127,328	1,058	4,336	.27	7.8
N.Y.A.	Initial	373	4,280	-	85	.23	11.5
	Rework	555	4,741	-	31	.06	8.5
	Total	928	9,021	-	116	.13	9.7
N.V.S.	Initial	1,416	19,673	65	241	.17	13.9
	Rework	286	1,274	54	36	.13	4.5
	Total	1,702	20,947	119	277	.16	12.3
All Programs	Initial	12,142,255	230,773,082	786,767	1,887,693	.16	19.0
	Rework	5,452,331	56,306,833	87,341	903,612	.17	10.3
	Total	17,594,586	287,079,915	874,108	2,791,305	.16	16.3

In Table 34 summarizing the eradication work by programs, it was not possible to make some of the adjustments in the gross acreages reported worked which are indicated in the footnote for Table 33.

Table 35 - Ribes Eradication Work, 1918-1944, Inclusive
By Land Ownership Classes

Land Ownership Class		Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
				Wild & Cult.	Cult. Only		Man Days	Ribes
State and Privately Owned Lands		Initial	12,140,506	228,216,841	786,359	1,869,635	.15	18.9
		Rework	5,387,635	55,856,980	87,340	896,504	.17	10.4
		Total	17,528,191	284,073,821	873,699	2,766,139	.16	16.2
Forests	White Mountain	Initial	8,841	816,447	85	2,887	.33	92.3
		Rework	12,316	328,609	-	2,039	.17	26.7
		Total	21,157	1,145,056	85	4,926	.23	54.1
	Allegheny	Initial	4,381	770,854	30	2,626	.60	176.0
		Rework	1,406	62,759	-	587	.42	44.5
		Total	5,787	833,613	30	3,213	.56	104.0
	Total	Initial	13,222	1,587,301	115	5,513	.42	120.0
		Rework	13,722	391,368	-	2,626	.19	23.5
		Total	26,944	1,978,669	115	8,139	.30	73.4
Parks	Acadia	Initial	20,716	893,940	293	11,227	.54	43.2
		Rework	13,935	58,485	1	4,482	.32	4.2
		Total	34,651	952,425	294	15,709	.45	27.5
	Hickory Run Dem. Area	Initial	4,800	75,000	-	1,318	.27	15.6
		Rework	-	-	-	-	-	-
		Total	4,800	75,000	-	1,318	.27	15.6
	Total	Initial	25,516	968,940	293	12,545	.49	38.0
		Rework	13,935	58,485	1	4,482	.32	4.2
		Total	39,451	1,027,425	294	17,027	.43	26.0
All Classes		Initial	12,179,244	230,773,082	786,767	1,887,693	.15	18.9
		Rework	5,415,342	56,306,833	87,341	903,612	.17	10.4
		Total	17,594,586	287,079,915	874,108	2,791,305	.16	16.3

Table 36. STATUS OF PINE REGENERATION WORK IN NET CONTROL AREA IN NORTHEASTERN REGION

DECEMBER 31, 1944

By States

State	Acreage of White Pine in Net Control Area	Total Acreage of Net Control Area	Acreage Worked			Acreage of Initial Work Still To Be Done	Acreage Now Requiring Examination To Determine Need For Rework	Acreage Now on Maintenance Basis	% Net Control Area	
			First Work	Second Work	Other Workings				Worked Once	Worked Twice
Maine	960,715	2,491,995	2,153,534	840,244	37,050	338,461	1,681,485	219,987	86.4	33.7
N. H.	1,346,132	3,139,121	2,860,246	851,402	48,113	278,875	1,949,664	295,354	91.1	27.1
Vt.	161,275	772,567	450,831	148,780	12,061	321,736	178,656	81,608	58.4	19.3
Mass.	627,036	1,784,689	1,751,288	937,918	103,180	33,401	633,727	804,724	98.1	52.6
R. I.	75,636	180,147	180,147	152,501	24,660	0	0	180,147	100.0	84.7
Conn.	79,835	495,225	495,225	323,930	62,900	0	9,451	485,774	100.0	65.4
N. Y.	830,154	2,913,459	2,349,599	1,025,732	246,200	563,860	1,076,256	465,349	80.6	35.2
N. J.	3,771	16,742	16,742	1,417	0	0	0	16,742	100.0	8.5
Penna.	145,101	813,558	576,333	131,939	32,833	237,225	440,233	68,849	70.8	16.2
All States	4,229,655	12,607,503	10,833,945	4,413,863	566,997	1,773,558	5,969,472	2,618,534	85.9	35.0

By Land Ownership Classes

State and Private Lands	Acreage of White Pine in Net Control Area	Total Acreage of Net Control Area	Acreage Worked			Acreage of Initial Work Still To Be Done	Acreage Now Requiring Examination To Determine Need For Rework	Acreage Now on Maintenance Basis	% Net Control Area	
			First Work	Second Work	Other Workings				Worked Once	Worked Twice
White Mt.	1,087	3,446	3,446	3,334	2,753	0	0	2,601,321	85.9	35.0
Allegheny	1,191	6,167	4,381	904	502	1,786	4,127	2,513	100.0	96.7
Total	2,278	9,613	7,827	4,238	3,255	1,786	4,127	2,513	81.4	44.1
Acadia	3,200	16,866	16,866	10,022	2,626	0	1,952	14,700	100.0	59.4
Hickory Run	280	800	800	0	0	0	800	0	100.0	0
Total	3,480	17,666	17,666	10,022	2,626	0	2,752	14,700	100.0	56.7
Total	4,229,655	12,607,503	10,833,945	4,413,863	566,997	1,773,558	5,969,472	2,618,534	85.9	35.0

Table 37 - STATUS OF BLISTER RUST CONTROL WORK IN PRESENT NET CONTROL AREA IN NORTHEASTERN REGION BY STATES AND DISTRICTS
(December 31, 1944)

State	District	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked			Acreage in Control Area			Percentage of Control Area					
					First Working	Second Working	Third Working	Now on Maintenance Basis	Still in Need of First Working	Now Requiring Examination To Determine Need For Rework	Detail Mapped	Worked Once	Worked Twice	Worked Three Times	On Maintenance	Now Needing Examination For Rework
Maine	Bradbury	344,752	87,541	309,983	243,444	58,544	7,115	50,553	101,308	153,744	89.9	70.6	17.0	2.1	14.7	29.4
	Calderara	795,390	319,388	693,580	713,167	293,648	13,305	41,525	82,723	610,008	87.1	89.6	36.9	1.7	5.2	10.4
	Curtis	880,422	401,518	605,799	830,014	356,522	2,261	80,731	50,408	697,622	68.8	94.3	40.5	0.3	9.2	5.7
	Waterville (No leader at present)	470,971	152,263	469,466	366,909	131,530	14,369	47,178	104,022	220,111	99.7	77.9	27.9	3.1	10.0	22.1
New Hampshire	Totals For State	2,491,995	960,715	2,078,828	2,153,534	840,244	37,050	219,987	338,461	1,681,485	83.4	86.4	33.7	1.5	8.8	13.6
	Baker	587,967	267,441	199,940	552,016	167,828	4,525	1,368	35,951	381,412	34.0	93.9	28.5	0.8	0.2	6.1
	Boomer	350,171	129,240	345,334	337,821	112,779	6,457	5,998	12,350	202,900	98.6	96.5	32.2	1.8	1.7	3.5
	Codman	287,297	113,028	213,970	261,299	75,706	5,096	0	25,998	176,354	76.2	91.0	26.4	1.8	0	9.0
Vermont	King	791,053	391,859	302,231	736,596	238,136	18,141	83,847	54,462	488,561	38.2	93.1	30.1	2.3	10.6	6.9
	Richardson	390,137	155,475	241,871	300,446	74,477	0	20,918	89,691	220,526	62.0	77.0	19.1	0	5.4	23.0
	Newman	732,491	289,089	124,051	672,063	182,476	13,894	183,223	60,423	479,911	16.9	91.8	24.9	1.9	25.0	8.2
	Totals For State	3,119,121	1,346,132	1,432,397	2,860,246	851,402	48,113	295,354	278,875	1,949,664	45.6	91.1	27.1	1.5	9.4	8.9
Mass.	McHolland	259,913	51,671	259,913	132,812	71,793	2,184	6,440	127,101	83,307	100.0	51.1	27.6	0.8	2.5	48.9
	Palmer	202,611	44,801	198,608	127,151	21,936	2,791	53,836	75,460	53,418	98.0	62.8	10.9	1.4	26.6	37.2
	Rose	310,043	64,803	285,790	190,868	55,001	7,086	21,332	119,175	41,931	92.2	61.6	17.7	2.3	6.9	38.4
	Totals For State	772,567	161,275	744,311	450,831	148,780	12,061	81,608	321,736	178,656	96.3	58.4	19.3	1.6	10.6	41.6
New York	Brockway	846,244	320,995	327,648	842,575	512,885	22,081	625,711	3,669	191,557	38.7	99.6	60.6	2.6	73.9	0.4
	Clave	397,447	140,704	187,029	378,571	74,128	1,227	0	18,876	298,415	47.1	95.3	18.7	0.3	0	4.7
	Doore	278,905	72,272	144,813	273,290	141,760	27,681	51,594	5,615	101,303	51.9	98.0	50.8	9.9	18.5	2.0
	Wheeler	262,093	93,065	222,715	256,852	209,145	52,191	127,419	5,241	42,352	85.0	98.0	79.8	19.9	43.6	2.0
Conn.	Totals For State	1,784,689	627,036	882,205	1,751,288	937,918	103,180	804,724	33,401	633,727	49.4	98.1	52.6	5.8	45.1	1.9
	White	180,147	75,636	119,278	180,147	152,501	24,660	180,147	0	0	66.2	100.0	84.7	13.7	100.0	0
	Miller (Litchfield Co.)	151,730	27,196	151,730	151,730	129,712	36,924	142,279	0	9,451	100.0	100.0	85.5	24.3	93.8	0
	Remainder of State	343,495	52,639	343,495	343,495	194,218	25,976	343,495	0	0	100.0	100.0	56.5	7.6	100.0	0
Penn.	Totals For State	495,225	79,635	495,225	495,225	323,930	62,900	485,774	0	9,451	100.0	100.0	65.4	12.7	98.1	0
	Barber	433,793	137,951	413,747	334,208	188,636	61,135	0	99,585	168,525	95.4	77.0	43.5	14.1	0	23.0
	Charlton	168,891	50,787	141,512	145,608	62,311	12,515	10,924	23,283	58,354	83.8	86.2	36.9	7.4	6.5	13.8
	Harpp	567,146	251,136	550,244	546,253	307,413	88,035	98,507	20,893	275,577	97.0	96.3	54.2	15.5	17.4	3.7
N. J.	Hick	599,580	141,197	305,684	479,211	104,019	19,062	240,560	120,369	109,930	51.0	79.9	17.3	3.2	40.1	20.1
	Holcomb	236,395	60,874	181,195	219,666	119,482	29,530	25,613	16,729	65,228	76.6	92.9	50.5	12.5	10.8	7.1
	Mulry	277,725	62,054	276,274	233,289	97,391	10,515	24,556	44,436	118,798	99.5	84.0	35.1	3.8	8.8	16.0
	Woolschlaeger	213,139	56,192	70,964	203,573	82,294	25,408	24,080	9,566	135,236	33.3	95.5	38.6	11.9	11.3	4.5
All States	Present Districts	416,790	69,913	10,908	187,791	64,186	0	41,109	223,999	144,608	2.6	45.1	15.4	0	9.9	54.9
	Counties Outside	2,913,459	830,154	1,950,528	2,349,599	1,025,732	246,200	465,349	563,860	1,076,256	66.9	80.6	35.2	8.4	16.0	19.4
	Totals For State	3,330,249	900,067	1,961,436	2,537,390	1,090,918	246,200	516,458	787,859	1,220,864	70.5	82.7	40.6	8.4	25.9	74.3
	Deberti	135,311	20,822	104,974	89,685	13,321	5,532	32,253	45,626	46,086	77.6	66.3	9.8	4.1	23.8	33.7
N. J.	Simmonds	184,925	31,711	150,010	109,226	10,491	1,423	11,705	75,699	76,697	81.1	59.1	5.7	0.8	6.3	40.9
	Counties Outside	493,322	92,563	418,107	377,422	103,127	25,337	24,891	115,900	317,450	84.8	76.5	21.9	5.2	5.0	23.5
	Present Districts	813,558	145,101	673,091	576,333	131,939	32,792	68,849	237,225	440,233	82.7	70.8	16.2	4.0	8.5	29.2
	Totals For State	1,307,880	237,664	1,091,287	955,759	245,160	58,129	93,740	353,125	757,683	86.9	73.3	28.1	9.2	13.5	52.7
All States	Present Districts	16,742	3,771	0	16,742	1,417	0	16,742	0	0	0	100.0	8.5	0	100.0	0
	Counties Outside	12,607,503	4,229,655	8,375,863	10,833,945	4,413,863	566,956	2,618,534	1,773,558	5,969,472	66.4	85.9	35.0	4.5	20.8	14.1
	Totals For State	12,624,245	4,233,426	8,375,863	10,850,687	4,415,273	568,412	2,635,276	1,775,116	5,974,944	66.4	85.9	35.0	4.5	20.8	14.1
	Counties Outside	12,607,503	4,229,655	8,375,863	10,833,945	4,413,863	566,956	2,618,534	1,773,558	5,969,472	66.4	85.9	35.0	4.5	20.8	14.1

Table 38 - Nursery Sanitation Work, 1930-1944, Inclusive

By States

State	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild & Cult.	Cult. Only		Man Days	Ribes
Maine	Initial	206	103,538	22	163	.79	502.6
	Rework	1,529	10,819	0	300	.20	7.1
	Total	1,735	114,357	22	463	.27	65.9
N. H.	All Rework	2,762	7,825	1	283	.10	2.8
Vt.	" "	2,230	4,914	75	409	.18	2.2
Mass.	Initial	723	30,481	112	139	.19	42.2
	Rework	7,310	19,376	182	1,114	.15	2.7
	Total	8,033	49,857	294	1,253	.16	6.2
R. I.	Initial	1,780	725	565	167	.09	0.4
	Rework	18,156	4,970	184	277	.02	0.3
	Total	19,936	5,695	749	444	.03	0.3
Conn.	Initial	7,683	16,934	165	335	.04	2.2
	Rework	61,001	18,875	980	2,537	.04	0.3
	Total	68,684	35,809	1,145	2,872	.04	0.5
N. Y.	Initial	3,735	31,579	655	424	.11	8.5
	Rework	105,331	134,126	1,246	6,014	.06	1.3
	Total	109,066	165,705	1,901	6,438	.06	1.5
N. J.	Initial	725	2,114	114	109	.14	2.7
	Rework	1,059	765	0	19	.02	0.7
	Total	1,845	2,879	114	128	.07	1.6
Penna.	Initial	4,414	38,954	494	343	.08	8.3
	Rework	27,843	54,037	73	4,131	.15	1.9
	Total	32,257	92,991	567	4,475	.14	2.9
All States	Initial	19,336	224,325	2,127	1,680	.09	11.6
	Rework	227,202	255,707	2,741	15,084	.07	1.1
	Total	246,538	480,032	4,868	16,765	.07	1.9

No separate record was kept of the special nursery sanitation work prior to 1930, the results of such activities from 1918-1929 being included in the regular ribes eradication summaries.

Table 39 - Nursery Sanitation Work, 1922-1944, Inclusive

By Programs

Program	Type of Work	Total Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild & Cult.	Cult. Only		Man Days	Ribes
Regular Cooperative	Initial	17,016	191,840	1,943	1,328½	.08	11.3
	Rework	153,160	182,686	2,511	7,896	.06	1.2
	Total	170,176	374,526	4,454	9,224½	.05	2.2
P.W.A.	Initial	415	25,600	3	147	.35	61.7
	Rework	15,422	14,381	96	1,356	.09	0.9
	Total	15,837	39,981	99	1,503	.09	2.5
D.C.C.	Initial	280	279	47	33	.12	1.0
	Rework	11,592	45,523	14	3,699	.32	3.9
	Total	11,872	45,802	61	3,732	.31	3.9
W.P.A. (F.A.)	Initial	690	72	45	9	.01	0.1
	Rework	29,908	11,662	119	1,742	.06	0.4
	Total	30,498	11,734	164	1,751	.06	0.4
W.P.A. (State)	All Rework	4,117	492	-	300	.07	0.1
S.C.S.	Initial	1,035	6,534	89	163	.16	6.3
	Rework	13,003	963	1	91½	.01	0.1
	Total	14,038	7,497	90	254½	.02	0.5
All Programs	Initial	19,336	224,325	2,127	1,680½	.09	11.6
	Rework	227,202	255,707	2,741	15,084½	.07	1.1
	Total	246,533	480,032	4,868	16,765	.07	1.9

Table 40 - Status of Nursery Sanitation Work - December 31, 1944

State	Nurseries Where Protection Established and Being Maintained					Number Nurseries Protected During 1944	No. Additional Nurseries Which Established Zones But Now Abandoned
	Number				Maximum Acreage of Control Areas		
	Federal	State	Private	Total			
Maine	—	1	1	2	409	—	5
N. H.	—	1	1	2	749	—	1
Vt.	—	1	—	1	700	—	—
Mass.	—	4	6	10	8,210	—	9
R. I.	—	—	—	—	—	—	6
Conn.	—	2	2	4	1,532	4	17
N. Y.	—	3	—	3	2,985	3	6
N. J.	—	1	—	1	600	1	1
Penn.	1	4	3	8	3,921	6	6
All States	1	17	13	31	19,156	14	51

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Table 41 - List of Nurseries Maintaining Sanitation Zones in Northeastern States
(December 31, 1944)

	<u>Acres of Sanitation Zones</u>
<u>Maine</u>	
Western Maine Nursery - Fryeburg, Maine.....	247
State Nursery - Orono, Maine.....	162
	409
<u>New Hampshire</u>	
Keene Forestry Associates - Keene, N. H.....	250
State Nursery - Boscaawen, N. H.....	499
	749
<u>Vermont</u>	
State Nursery - Essex Junction, Vt.....	700
<u>Massachusetts</u>	
Department of Conservation Nursery - Amherst, Mass.....	225
Department of Conservation Nursery - Bridgewater, Mass.....	100
Department of Conservation Nursery - Clinton, Mass.....	150
Department of Conservation Nursery - Erving, Mass.....	50
Franklin Forestry Company - Shelburne Falls, Mass.....	435
Kelsey Highlands Nursery - Boxford, Mass.....	900
Little Tree Farms Nursery - Framingham, Mass.....	725
Wyman Nursery - Framingham, Mass.....	1,000
Littlefield-Wyman Nursery - No. Abington, Mass.....	4,625
Bay State Nursery - Abington, Mass.....	8,210
<u>Connecticut</u>	
Northeastern Forestry Company - Cheshire, Conn.....	537
State Nursery - Barkhamstead, Conn.....	492
State Nursery - Tolland, Conn.....	365
Great Pond Nursery - Simsbury, Conn.....	188
	1,582
<u>New York</u>	
State Nursery - Saratoga Springs, N. Y.....	1,605
State Nursery - Lowville, N. Y.....	1,150
New York State College of Forestry Nursery - Syracuse, N. Y.....	230
	2,985
<u>New Jersey</u>	
State Nursery - Washington Crossing, N. J.....	600

Table 41 - List of Nurseries Maintaining Sanitation Zones in Northeastern States (Continued)
 (December 31, 1944)

Acreage of
Sanitation Zones

Pennsylvania

Clearfield State Nursery - Clearfield, Penna.....	370
Greenwood State Nursery - Petersburg, Penna.....	411
Mt. Alto State Nursery - Mt. Alto, Penna.....	366
Rockview State Nursery - Pleasant Gap, Penna.....	354
S. C. S. Nursery - Mt. Eagle, Penna.....	215
Andorra Nursery - Chester Hill, Penna.....	1,065
Fairview Nursery - Fairview, Penna.....	559
Doyle Nursery - Seven Stars, Penna.....	581
	<u>3,921</u>

All States - (31 nurseries)19,156

Table 42 - Special Ribes Nigrum Elimination Work, 1923-1944, Inclusive - By States

State	No. Properties Inspected	No. Patches Located	No. Ribes Destroyed			Total Man Days
			Nigrum	Other Cult.	Total	
Mass.	750,359	6,657	42,629*	432	43,061	7,347
R. I.	110,137	1,917	16,219	1,093	17,312	1,929
Conn.	318,344	32,695**	7,464	42,397	49,861	14,610
N. Y.	526,593	5,128	37,064	761	37,825	5,250
All States	1,705,433	46,397	103,376	44,683	148,059	29,136

*Includes 556 bushes pulled in connection with special black currant elimination project around nurseries in 1925 and 1926.

**The survey in Connecticut included all cultivated ribes. It is estimated that the number of black currant patches in that state did not exceed 1500.

Table 43 - Special Ribes Nigrum Elimination Work, 1923-1944, Inclusive - By Program

Program	No. Properties Inspected	No. Patches Located	No. Ribes Destroyed			Total Man Days
			Nigrum	Other Cult.	Total	
Regular Cooperative	1,082,878	14,227	85,624	20,550	106,174	14,155
P.W.A.	6,157	39	7,486	-	7,486	375
W.P.A.(F.A.)	180,313	869	3,156	432	3,588	1,061
C.W.A.	195,750	5,404	-	-	-	1,850
E.R.A.	240,335	25,858	7,110	23,701	30,811	11,675
All Programs	1,705,433	46,397	103,376	44,683	148,059	29,136

C.W.A. project consisted of location work only.

Table 44 - Status of Special Ribes Nigrum Elimination Work - December 31, 1944

State	Years Work Performed	Total Number Townships in State	No. Townships Where Special Black Currant Elimination Work	
			Completed	Partially Completed
Mass.	1930-1940, Incl.	355	346*	-
R. I.	1929-1933 "	39	39	-
Conn.	1930-1935 "	169	169	-
N. Y.	1928-1940 "	996	236	39
All States	-	1,559	790	39

*Nine additional townships on islands next to mainland will not be worked.

In the other states, Ribes nigrum have been eradicated in the worked portions of the control areas in conjunction with regular control activities. Very few black currants have been found in these states.

Table 45 - State Compensation Paid For Cultivated Ribes
Destroyed During Period 1918-1944, Inclusive

State	Total No. Cult. Ribes Destroyed	No. Bushes Paid For	% Bushes Paid For	No. Persons Paid Compensation	Amount Paid in Reimbursement	Average Amount Paid Per Bush
Maine	153,052	0	-	0	0	-
N. H.	158,925	2,008	1.3	63	\$550.60	\$.274
Vt.	18,033	1,646	9.1	133	792.91	.482
Mass.	326,806	42,074	12.9	673	15,020.15	.357
R. I.	41,758	1,410	3.4	58	509.79	.362
Conn.	90,685	175	0.2	16	103.50	.591
N. Y.	179,957	16,338	9.1	1,151	5,587.99	.342
N. J.	1,842	0	-	0	0	-
Penna.	55,977	513	0.9	70	167.25	.326
All States	1,027,035	64,164	6.3	2,164	\$22,732.19	\$.354

No federal money has been paid for ribes compensation.

As indicated in Table 45, no compensation has been paid for the 153,052 cultivated ribes destroyed in Maine during the period 1918-1944, inclusive.

Table 45 includes 294 cultivated bushes removed in connection with control activities at Acadia National Park, and 115 cultivated ribes destroyed on control projects on National Forest lands. No compensation was paid for such bushes removed from the control areas on these federal land projects.

Table 46 - Blister Rust Canker Elimination Work, 1932-1944, Inclusive
By States and Programs

State	Program	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	Total No. Cankers Removed	Total Man Days
Maine	Regular	97,748	8,267	12,804	21,435	811
	C.C.C.	58,261	2,957	8,879	29,745	2,177
	Total	156,009	11,224	21,683	51,180	2,988
N. H.	All W.P.A. (F.A.)	28,581	5,731	638	711	219
Vt.	Regular	24,647	1,597	1,765	3,116	189
	W.P.A.(F.A.)	226,489	38,342	18,838	21,253	2,491
	W.P.A.(State)	21,457	985	786	895	367
	Total	272,593	40,924	21,389	25,264	3,047
Mass.	W.P.A.(F.A.)	116,167	14,956	3,682	4,114	3,293
	C.W.A.	4,648,000	17,303	12,784	17,511	5,409
	Total	4,764,167	32,259	16,466	21,625	8,702
N. Y.	Regular	17,350	378	51	390	82
	W.P.A.(F.A.)	1,577,875	149,379	190,702	255,076	12,420
	W.P.A.(State)	324,770	8,868	7,571	8,257	1,519
	Total	1,919,995	158,625	198,324	263,723	14,021
Penna.	C.C.C.	567,018	28,308	76,048	458,522	4,564
	W.P.A.(F.A.)	352,460	4,287	53,927	110,377	2,742
	Total	919,478	32,595	129,975	568,899	7,306
All States	Regular	139,745	10,242	14,620	24,941	1,032
	C.C.C.	625,279	31,265	84,927	488,267	6,741
	W.P.A.(F.A.)	2,301,572	212,695	267,787	391,531	21,165
	W.P.A.(State)	346,227	9,853	8,357	9,152	1,886
	C.W.A.	4,648,000	17,303	12,784	17,511	5,409
	Total	8,060,823	281,358	388,475	931,402	36,283

No special blister rust canker elimination work was performed in the region prior to 1932.

Table 47 - Blister Rust Canker Elimination Work, 1932-1944, Inclusive
By Land Ownership Classes

Ownership Class	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	Number Infected Pines From Which Cankers Removed	Total No. Cankers Removed	Total Man Days
State and Private Lands	8,000,016	278,082	378,881	900,116	34,006
Acadia National Park, Me.	60,807	3,276	9,594	31,286	2,217
Totals	8,060,823	281,358	388,475	931,402	36,283

Table 48 - Total Expenditures For All Blister Rust Control Activities During Calendar Year 1944
By Cooperating Agencies

State	Federal Funds					States and Local Cooperators							Grand Total
	B.E. and P.Q.		Forest Service	Park Service	Total	States		Private	Towns	Counties	Total		
	3101	3103				Cash	Contributed Services						
Maine	21,231.02	20,364.76	143.21	2709.00	44,447.99	5,451.17	733.00	79.80	7,337.12	-	13,601.09	58,049.08	
N. H.	19,770.37	11,422.96	349.11	-	31,542.44	6,404.97	1,958.13	15.50	3,538.14	-	11,976.74	43,519.18	
Vt.	14,373.93	6,071.92	-	-	20,445.85	277.31	1,304.88	29.96	4,877.44	-	6,489.59	26,935.44	
Mass.	19,187.77	7,729.50	-	-	26,917.27	5,240.74	1,494.00	559.36	162.02	-	7,456.12	34,373.39	
R. I.	-	2,910.06	-	-	2,910.06	2,970.15	1,571.64	-	-	-	4,541.79	7,451.85	
Conn.	4,898.08	1,971.08	-	-	6,869.16	4,570.76	1,299.99	34.80	470.00	-	6,375.55	13,244.71	
N. Y.	22,013.93	39,847.78	-	-	61,861.71	16,126.31	11,079.96	74.88	1,252.00	11,536.91	40,070.06	101,931.77	
Penn.	12,496.73	6,716.11	-	-	19,212.84	5,858.62	882.00	39.68	-	-	6,780.30	25,993.14	
All States	13,971.83	97,034.17	492.32	2709.00	214,207.32	46,900.03	20,333.60	833.98	17,626.72	11,536.91	97,291.24	311,498.56	

Table 48 does not include Federal 3101 expenditures for the Cambridge, Mass. regional office totalling \$28,820.26 during the calendar year 1944.

**Table 49 - Total Cost of All Cooperative Blight and Pest Control Activities
in Northeastern States During Period July 1, 1935 to December 31, 1944 Inclusive**

State			Maine	N. H.	Vt.	Mass.	Conn.	N. Y.	N. J.	Penna.	All States	
State and Local Cooperators	State		168,076.33	323,613.24	66,278.79	320,214.19	1,075,077.75	1,373,071.48	16,828.15	127,669.40	2,643,902.88	
	Individuals		85,349.98	49,031.17	75,032.74	102,165.14	9,988.99	174,534.53	-	2,273.36	498,957.27	
	Towns		148,621.54	440,269.43	31,015.05	24,118.64	26,267.45	7,966.12	-	-	680,258.23	
	Counties		-	1,724.08	-	-	-	70,844.38	-	-	72,568.46	
	Total		402,047.85	814,637.92	172,326.58	446,497.97	1,101,334.19	1,626,416.51	16,828.15	129,942.76	3,895,686.84	
Federal Funds	Regular	B.P.I.		249,874.54	434,415.50	119,398.94	323,303.88	1,065.16	479,769.34	6,271.28	31,619.21	1,791,601.68
		B.E. and P.Q.	3101	119,297.73	117,980.32	78,049.00	112,929.70	2,634.24	131,456.78	2,949.64	78,840.98	690,122.68
			3103	47,276.53	36,169.96	15,255.74	22,769.16	3,088.79	121,724.29	-	11,575.08	272,288.67
			Total	166,574.26	154,150.28	93,304.74	135,698.86	5,723.03	253,181.07	2,949.64	90,416.06	962,411.35
		Forest Service		284.46	3,416.54	-	-	-	-	-	1,009.77	4,710.77
		Park Service		16,885.05	-	-	-	-	-	-	5,598.08	22,483.13
	Sub-Total		433,618.31	591,982.32	212,703.68	459,002.74	1,077,758.19	732,950.41	9,220.92	128,643.12	2,781,206.93	
	Emergency	C.C.C.		355,610.43	149,340.77	95,905.47	64,803.64	177,053.96	774,782.95	346.50	895,066.17	2,624,455.52
		P.W.A.		69,128.95	68,597.21	32,168.20	52,071.89	1,479.39	92,334.23	3,081.48	45,474.63	397,763.96
		W.P.A.-State Program		6,597.97	20,595.37	8,685.80	17,413.66	2,690.64	23,587.53	-	23,507.24	335,778.97
		W.P.A.-Federal "		649,730.76	632,428.87	402,140.28	407,457.66	1,153.92	1,132,151.77	7,303.37	455,814.65	3,818,439.90
		C.W.A.		-	-	-	31,134.08	1,878.10	-	-	-	37,072.18
		E.R.A.		1,426.80	-	-	10,998.20	21,478.40	2,779.70	-	-	109,683.10
		A.R.A.		-	-	-	-	1,152.71	8,010.58	-	4,254.65	15,057.94
		S.C.S.		-	-	-	-	-	9,087.87	230.25	9,613.27	24,728.58
		N.Y.A. & N.V.S.		-	-	-	-	-	812.40	-	220.80	1,033.20
	Sub-Total		1,082,494.91	870,962.22	538,899.75	583,579.03	1,600,947.39	2,043,547.03	10,961.60	1,433,951.41	7,364,013.35	
	Total Federal Funds			1,516,113.22	1,462,944.54	751,603.43	1,042,581.77	2,678,705.58	2,776,497.44	20,182.52	1,562,594.53	10,145,220.28
Grand Total			1,918,161.07	2,277,582.46	923,930.01	1,489,079.74	3,779,039.77	4,402,913.95	37,010.67	1,692,537.29	14,040,907.12	
Percentage of Total			13.7	16.2	6.6	10.6	7.0	31.4	0.2	12.0	100.0	

Table 49 does not include any expenditures for the Cambridge, Mass. regional office. Expenditures during the period July 1, 1935 to December 31, 1944 were as follows: B.E. and P.Q. funds - \$155,504.59; W.P.A. project funds - \$35,107.20; and W.P.A. administrative funds - \$34,402.59. No record is available at Cambridge of the Bureau of Plant Industry and P.W.A. expenditures for the regional office prior to July, 1935.

WHITE PINE BLISTER RUST CONTROL
WHITE MOUNTAIN NATIONAL FOREST
1944

The white pine blister rust project on the White Mountain National Forest was continued in the spring of 1943 and was completed June 30, 1944. In the spring of 1943 all pine areas, with the exception of those in Maine, were mapped, scouted for ribes, and sections requiring crew work were indicated on scout maps. The two areas in Maine were mapped during October, 1943.

With Lewis H. Porter as foreman, ribes eradication began in Thornton on May 22. One experienced laborer was available and one new man, who knew ribes and quickly learned control methods, was hired for the period when the work would be in the vicinity of Plymouth. Conditions for ribes eradication were excellent at this early date.

In Thornton, Easton and Benton, ribes eradication was completed in May. The foreman and the experienced laborer then moved to North Conway for the Albany and Chatham areas and later to Stow for the Maine areas.

The foreman and crew were given a \$3.00 per diem allowance when in pay and duty status in the field which increased the cost about forty-three percent.

Accomplishments - 1944

Ribes Eradication

Area	Type of Work	Acreage Worked	Number Ribes Pulled	Man Hours	Cost
Thornton, N.H.	Rework	51	826	64	\$ 65.08
Easton, N.H.	"	16	320	24	22.16
Benton, N.H.	"	44	398	72	72.94
Albany, N.H.	"	115	743	144	151.53
Chatham, N.H.	"	17	47	24	37.40
Gilead, Maine	"	275	1,103	32	29.04
Stow, Maine	"	111	365	40	45.86
Stoneham, Maine	Initial	112	88	64	68.31
Totals	-	741	3,892	464	\$492.32

The cost in the above table can be divided as follows: Wages, \$308.80; per diem allowance, \$172.50; and transportation, \$11.02.

The areas reworked do not represent the same acreage involved in the initial workings. Consequently, a comparison of ribes and man-hour data would have little or no value.

The Stoneham area involved a walk of about four miles each way, and the trail traversed a high ridge. When this area was examined by the two-man crew, the ferns and undergrowth were so thick, that it needs to be worked again in the early spring. On the Gilead area in Maine, the ribes were concentrated in several runs, while the balance of the unit was practically free of ribes.

It is recommended that the ribes sites along the runs in Gilead and the Stoneham areas be examined again in the spring of 1946 if men are available.

Status of Work in Present Net Control Area

1.	Total acreage (pine plus protection zones).....	3,446
2.	Acreage of white pine.....	1,087
3.	Acreage that has been detailed mapped.....	3,446
4.	Acreage initially cleared of ribes.....	3,446
5.	Acreage worked twice for ribes.....	3,334
6.	Acreage worked third time for ribes.....	2,753
7.	Acreage now on maintenance.....	2,513

Additional Acreage Discontinued from Control Area

In addition to the acreage in the present net control area, 6,738 acres were cleared of ribes, but this acreage was discontinued from the control area, due to various reasons, chiefly insufficient pine to justify maintaining control. See attached sheet giving control data by block units.

Conclusion

White pine blister rust control has been effectively established on the White Mountain National Forest and, with the exception of the Gilead and Stoneham areas, will need no further action for several years. Areas where logging is now in progress, or may be conducted in the future, may require examination for ribes regrowth two or three years after such operations cease.

S. H. Boomer
Pathologist
Plant Disease Control

December 13, 1944.

STATUS OF RIBES ERADICATION WORK BY BLOCK UNITS
IN PRESENT NET CONTROL AREA

Area	Total Acreage of Area	First Working		Second Working		Third Working		Acreage Placed on Mainte- nance up to Dec.1944	Rework Needed		Remarks
		Acreage	Year	Acreage	Year	Acreage	Year		Acreage	Year*	
Bartlett - 4	900	900	1924	900	1933	900	1943	900	150	1950	Work swamps and runs
Albany - 5	438	438	1924	438	1934	438	1943 1944	438	100	1950	" "
Albany - 6	320	320	1924	320	1934	320	1943 1944	320	100	1950	" "
Albany - 11	452	452	1924	452	1934	452	1943 1944	452	75	1950	" "
Chatham - 2	103	103	1939	103	1943 1944			103	17	1950	" "
Hales Loc.-5	189	189	1924	189	1935	189	1943	189	50	1950	" "
Easton - 4	100	100	1935	100	1943 1944			-	20	1948	" "
Benton - 3	86	86	1925 1935	86	1936	68	1943 1944	-	68	1948	" "
Thornton - 4	130	130	1931	130	1934 1935			-	30	1948	" "
Thornton - 6	230	230	1931	230	1943 1944			-	50	1948	" "
Gilead - 9	275	275	1936	275	1937	275	1944	-	42	1946	Recheck swamps early spring
Stow - 1	111	111	1926	111	1933	111	1944	111	111	1950	
Stoneham - 1	112	112	1944						65	1946	Recheck in early spring
Totals	3,446	3,446	-	3,334	-	2,753	-	2,513	878	-	-

*If logging or fire disturbances prior to that date do not cause ribes regrowth, necessitating earlier examinations.

SUMMARY OF ACREAGES DISCONTINUED FROM CONTROL AREA BY U.S. FOREST SERVICE

(Not included in net control area)

Area	Total Acreage of Area	First Working		Second Working		Third Working	
		Acreage	Year	Acreage	Year	Acreage	Year
Albany - 1	3,467	3,467	1924	1,339	1933 1934	1,184	1939
Albany - 5	155	155	1924				
Albany - 11	1,522	1,522	1924	194	1934	187	1943
Bartlett Exp. Station Area	299	299	1924	299	1934	299	1938
Chatham - 2	37	37	1939				
Benton - 3	151	151	1925	33	1935		
Thornton Gore	50	50	1929	50	1933		
Thornton- Mud Pond - 5	35	35	1931				
Oliverian Bk. Camp Ground	75	75	1933				
Sugar Loaf	347	347	1926	347	1933	347	1938
Other Areas	600	600	1938				
Totals	6,738	6,738	-	2,262	-	2,017	-

The decisions to discontinue various units of the control area on the White Mountain National Forest were made by U.S. Forest Service officials. The reasons were apparently as follows:

Albany Area #1, known as Passaconaway, comprises 3,467 acres and contains considerable white pine, mostly mature growth which has been given a high degree of protection. It is expected that the whole valley will in time revert to hardwood, fir and spruce. Some portions were originally regarded as potential pine sites. The elevation is above 1200 feet and any reduction in crown cover or disturbance of the soil results in a new crop of ribes. All along the Swift River sand covers the ribes to a depth of several inches in times of high water, making it almost impossible to get out the roots. Each time the area was worked a large number of ribes were found. The Passaconaway area has been given as much study as any control area in New Hampshire by the district leader, state leader and various rangers and

supervisors of the National Forest. When this control area was established in 1924, it did not appear so difficult to eradicate the ribes as later experiences demonstrated.

Albany Area #5 contains 155 acres and was worked only in 1924 as a potential pine site. It was discontinued later because the existing pine did not meet minimum stocking requirements, and no planting was contemplated.

Albany Area #11 - 1,522 acres south of the Swift River. It was worked in 1924 as a potential pine site for reforestation. Few ribes were found. Reworking was limited to 194 acres in 1934 and 187 acres in 1943. Discontinued because existing pine not of much importance and no reforestation was planned.

Bartlett Experimental Area - 299 acres - Worked in 1924, 1934 and 1938. Could very well have been placed on maintenance, but the Forest Service decided to discontinue it. The white pine will, for the most part, come within the protection zone of adjoining pine areas.

Chatham #2 Area was not discontinued in its entirety but was placed on maintenance except for 37 acres discontinued through a reduction in the width of the protection zone.

Benton #3 Area - 151 acres - Logged - now consists of hardwood sprouts, pin cherry, fir and spruce.

Thornton Gore and Mud Pond #5 - The pines in these areas were either blown down by the hurricane or the areas had too few pines to meet present stocking requirements.

Oliverian Block - Camp Ground - 75 acres - worked only in 1933. Decision made by Forest Service not to maintain control.

Sugar Loaf and Other Areas (347 and 600 acres respectively) - located in extreme western part of the National Forest, and were not listed by the Forest Service for further work. Reasons for discontinuing them are not known but may have been due to small size and scattered location, hurricane damage, numerous ribes or lack of sufficient pine stocking.

ANNUAL REPORT
ON
THE CONTROL OF WHITE PINE BLISTER RUST
IN THE
SOUTHERN APPALACHIAN REGION
FOR THE
CALENDAR YEAR 1944

United States Department of Agriculture
Agricultural Research Administration
Bureau of Entomology and Plant Quarantine
Southern Appalachian Regional Office
401 News Record Building
Harrisonburg, Virginia
March 1945

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WHITE PINE BLISTER RUST CONTROL IN THE SOUTHERN APPALACHIAN REGION

ANNUAL REPORT * FOR 1944

PART I

GENERAL SUMMARY

By

J. Curtis Ball, Regional Leader

During 1944 the Southern Appalachian Blister Rust Control organization of the Bureau of Entomology and Plant Quarantine cooperated with the States of Delaware, Maryland, Georgia, North Carolina, Tennessee, Virginia and West Virginia as well as the National Forest Service in regions 7 and 8 and the National Park Service in region 1 in performing white pine blister rust control work on state, private and federally owned lands within the control area of the Southern Appalachian white pine region.

Table I

Summary of Accomplishments During 1944

Agency	: Expenditures	: Acres * : Ribes-Free	: Acres Worked: First	: Ribes : Other	: Man : Destroyed	: Days :
Forest Service	: 74,802.02	: 268,873	: 6,528	: 16,183	: 647,981	: 6,729
National Park Service	: 3,679.72	: -	: 360	: 772	: 26,546	: 509
E.P.Q. (Coop. work on state and private lands)	: 42,270.19	: 29,600	: 2,567	: 17,121	: 238,135	: 4,357
TOTAL	: 120,751.93	: 298,473	: 9,455	: 34,076	: 912,662	: 11,595

*Acres ribes-free represents acreage found to be naturally ribes-free at the time of inspection.

Due to the fact that there is so much intermingled ownership within the National Forests it is impossible to segregate the acreage worked in the field by operating agencies hence it has been more or less a give and take proposition between the Bureau Cooperative work and the Forest Service. The following table shows the status of ribes eradication by land ownership as of December 31, 1944.

Table II

Status of Ribes Eradication by Land Ownership
as of December 31, 1944

Land Ownership	Initial Ribes Eradication		Average Per Acre	
	Acres	Acres Worked	Ribes	Man
	Ribes- Free	First : Other	Destroyed	Days
National Forest Lands	: 238,933 :	: 6,528 : 16,183 :	: 28.5 :	: 0.29 :
National Park Lands	: - :	: 360 : 772 :	: 23.4 :	: 0.45 :
Sub-total (Federal)	: 238,933 :	: 6,888 : 16,955 :	: 28.2 :	: 0.30 :
State and Private Land	: 59,540 :	: 2,567 : 17,121 :	: 12.1 :	: 0.22 :
TOTAL	:	:	:	:
ALL OWNERSHIP	: 298,473 :	: 9,455 : 34,076 :	: 20.9 :	: 0.27 :

Because of certain discrepancies in early records it is difficult at the present time to ascertain the exact percentage of initial work completed to date. Much of the early work was accomplished by general reconnaissance and although a large acreage was estimated as being in the control area actually only a small portion of this total acreage reported was worked by ribes eradication crews. When the grid survey was started it was nearly impossible to tie-in the old ribes eradication areas because of inadequate maps, no original maps available, increase in white pine densities and acreage and various other reasons. Because of this it has been difficult to determine, with any degree of accuracy, the actual status of initial and rework acreage. This fact alone has caused us to alter our concept of thinking with regards to setting up our permanent control records. A fairly reasonable estimate, however, would be 93 percent completion on initial ribes eradication.

Although we have not been greatly affected in obtaining labor to perform ribes eradication work we have been handicapped in securing adequate labor to do checking and survey work. This is because so many of the younger men have been inducted into the armed services. A large proportion of the older men residing in the mountains are willing workers but they are not able to stand the grind of extensive walking over rough terrain which is demanded of checking and survey crews. In spite of this, however, we have accomplished more survey work in some states than any other year since the war, mainly because of the fact that we have been able to retain a small number of our old key men.

The general status of control work in the region now stands with three states actually engaged in control operation the year around and six states on maintenance the former being Virginia, West Virginia and Georgia and the latter Delaware, Maryland, Kentucky, North Carolina, South Carolina and Tennessee. Initial work in Kentucky and South Carolina was completed in 1934 and no seasonal

work has been performed since. Since 1941 only seasonal work has been carried on in Delaware and Maryland. Because of infection and ribes conditions in western Maryland a thorough post check should be made in 1945. A few checks made this year indicated the need of some more rework. In August 1944, North Carolina activities were closed down and in Tennessee no further work has been done since October 1944. Resurveys are needed in Kentucky and South Carolina as well as an extension of the grid survey in parts of the white pine belt in North Carolina. All detailed surveys have been completed in Tennessee and outside of completing some rework in the Cumberland Mountains it is now only necessary to conduct periodic post checks and perform ribes eradication where needed. Some post checking, reeradication and surveys will be performed in North Carolina in 1945.

During 1944 there was no decided spread of the rust throughout the region. The only new infection center was found in Patrick County, Virginia where infected ribes were discovered near the crest of the Blue Ridge Mountains. As yet no infection on white pine has been found south of Giles County, Virginia, however, infected ribes were found as far south as McDowell County, North Carolina in 1941.

Because of the peculiarities in ribes and white pine distribution throughout the Southern Appalachian Mountains, whereas so much of our pine acreage is naturally free of wild ribes, we have been able to hold our own as well as make good progress in our control work during the last few years as the following table shows.

Table III

A brief comparison of work performed 3 years previous to our entering the war and the last three years since we have been actually engaged in the war.

Before We Entered The War				During War Period			
: Acres	: Ribes	: Man	:	: Acres	: Ribes	: Man	:
: Year	: Worked	: Pulled	: Days	: Year	: Worked	: Pulled	: Days
: 1939	:491,106	:3,230,851	:34,218	: 1942	:197,541	:906,407	: 9,238
: 1940	:655,821	:3,106,985	:28,663	: 1943	:562,627	:817,615	:10,191
: 1941	:615,872	:2,090,146	:24,923	: 1944	:342,004	:912,662	:11,595
:Ribes & Man-Days				:Ribes & Man-Days:			
: Per Acre for 3:	4.8	: 0.05	:	: Per Acre for 3 :	2.4	: 0.03	:
: Years Period :	:	:	:	: Year Period :	:	:	:

From the above table by comparing the production figures on a per acre basis it can be seen that the amount of work accomplished for each three year period is in proportion as to man days expended and ribes pulled. Perhaps more comparable figures could be had if in the past we had exact figures for work performed on ribes-bearing lands only and excluding all acreage figures found to be ribes-free.

PART II

Leadership, Coordination and Technical Direction of Blister Rust Control

By The
Bureau of Entomology and Plant Quarantine

Work Project BLR-1-2

By
J. Curtis Ball, Regional Leader

OBJECTIVES

On the following pages an attempt has been made to present as briefly as possible, blister rust control activities in the Southern Appalachian White Pine Blister Rust Control Region during the 1944 calendar year as well as to give a picture of the status of control work from the beginning of operations in 1933 through 1944.

The objective has been to present a summary of field activities, not only as the regional leader sees it but also from the viewpoint of the area and assistant area leaders, who are directly concerned with the technical direction of blister rust control work performed by the various agencies within their organizational units.

ORGANIZATION

During the year of 1943 the reorganization of the region was initiated by combining several states in the region into two administrative areas each under the direct leadership of an area leader and one assistant leader. The area organization and white pine distribution map on page 5 shows graphically the present organization set-up.

The reason for the area organization was brought about because of two states and parts of other states being placed on full maintenance necessitating the reduction in permanent personnel. Therefore to maintain the continuity of cooperative control work throughout the region it was necessary to place more responsibilities on the men retained in the region by designating an area to administer instead of a single state. In the states now on maintenance the main work to be continued on a seasonal basis will be pest checking and conducting necessary ribes eradication where needed to maintain such areas within the ribes-bearing section of the control area.

So as to be in closer contact with field operations the regional office was moved from Richmond, Virginia to Harrisonburg, Virginia in September 1944. This move fits in with the reorganization plan whereas it is planned to consolidate the area leaders headquarters with that of the regional office for the purpose of closer integration of field and administrative activities.

SOUTHERN APPALACHIAN BLISTER RUST CONTROL REGION

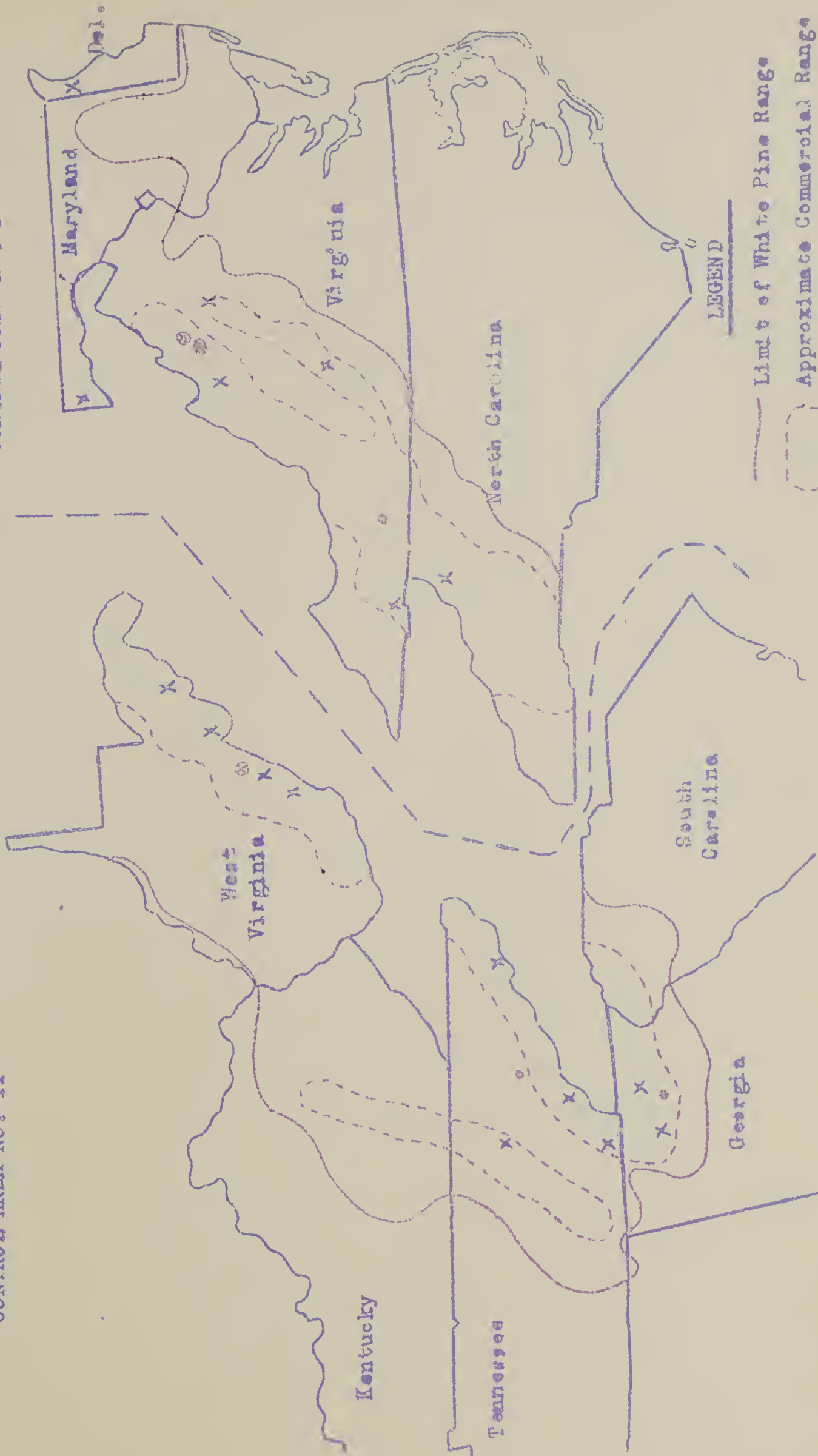
Area Organization and White Pine Range

1944

1944

CONTROL AREA NO. II

CONTROL AREA NO. I



LEGEND

— Limit of White Pine Range

- - - Approximate Commercial Range of White Pine

● Regional Office-Harrisonburg, Va.
⊙ Area Leaders Headquarters
x Assistant Area Leaders

Below is a list of the personnel employed in the region during the 1944 calendar year.

<u>Personnel</u>	<u>Assignment</u>
<u>1. Regional Office</u>	
Roy G. Pierce P-4-----	Regional Leader Retired Oct. 31, 1944
J. Curtis Ball P-3-----	Assistant Regional Leader Appointed Regional Leader Nov. 1, 1944 to P-4
John R. George CAF-7-----	Jr. Adm. Assistant Promoted CAF-9 Dec. 23, 1944
Mrs. Ellen G. Fischer CAF-4-----	Clerk-Stenographer
Miss Jean A. Nielson CAF-3-----	Clerk-Stenographer Transferred to Army Air Base Nov. 16, 1944, Richmond, Virginia
Raymond C. Spain SP-2-----	Draftsman Resigned June 30, 1944
Mrs. June F. Garber CAF-2-----	Clerk-Typist L/A Dec. 8, 1944-Pending Appointment
Miss Mary B. Mitchell CAF-3-----	Clerk-Stenographer L/A Dec. 15, 1944-Pending Appointment
<u>2. Field Area No. 1</u>	
H. E. Yost P-3-----	Area Leader Delaware, Maryland, Virginia, North Carolina and Washington, D. C.
H. B. Teague P-2-----	Assistant Area Leader
G. C. Cramer SP-6-----	Field Supervisor
Obbie F. Simmons SP-5-----	Field Supervisor Resigned May 23, 1944
Henry Simmons SP-5-----	Field Supervisor L/A Appointment
R. S. Ruddle CAF-3-----	Clerk-Stenographer Assigned to Area Leader
Joyce Cramer CAF-2-----	Clerk-Typist
<u>3. Field Area No. 2</u>	
Ralph W. Welch P-3-----	Area Leader West Virginia, Kentucky, Tennessee, Georgia and South Carolina
W. V. Zimmer P-2-----	Assistant Area Leader Dahlongega, Georgia
R. D. Tanksley P-2-----	State Leader Tennessee Resigned June 12, 1944
Glenden L. Neaton SP-5-----	Field Supervisor West Virginia

Fred W. Hall SP-5-----Field Supervisor
 Georgia
 Ira O. Garland SP-5-----Field Supervisor
 Resigned September 30, 1944
 Miss Jane C. Moore CAF-3-----Clerk-Stenographer
 Marlinton, W. Va.
 Mrs. Suella F. Kimbrough CAF-3-----Clerk-Stenographer
 Position Terminated
 Miss Virginia M. Ashe CAF-3-----Clerk-Stenographer
 Resigned Sept. 2, 1944

4. Control Methods and Investigations

Dr. P. L. Rusden P-3-----In Charge Eastern Region
 Cambridge, Mass.
 H. E. Yost P-3-----Pathologist, Southern Appalachian

HISTORY OF CONTROL WORK IN THE REGION

Although white pine blister rust control work was not fully inaugurated in this region until about 1934 a small amount of work was accomplished under the CCC program in 1933 and some general reconnaissance work performed by Mr. Roy G. Pierce and Forest Service officials from 1929 to 1932.

Under the emergency program, work was greatly accelerated from 1934 until the termination of the CCC and WPA programs. The peak of operational activity was reached in the year of 1936 both in the number of acres worked and the number of ribes destroyed. This was the period when large acreages of white pine and protective zones were roughly mapped or estimated. These early operations were not well planned, with the results that numerous revisions had to be made in reports and omnibus tables during the last few years. It was eventually realized that a uniform permanent control record system was needed as well as a uniform system of conducting survey, ribes eradication and checking activities. With the inauguration of definite and uniform control methods as well as the elimination of numerous field and office forms we have been making good headway in reclassifying our pine areas and readjusting our records. To do this it has been necessary to conduct a great deal of survey work in order to determine once and for all what the actual field conditions are. We still have a good deal of work to do before final adjustments are made on the permanent control record sheets since it is necessary to carry a lot of estimated acreage figures until the resurveys are completed. Due to this situation therefore our net control acreage reported as worked in the omnibus tables and other tables will only carry the actual acreage surveyed in those states which are as yet not placed on full maintenance. The only net acreage estimated figures will be known ribes-free lands in states now on maintenance as well as some estimated crew acreage worked several years ago but as yet not surveyed. Generally therefore our annual figures, out of necessity, will fluctuate until the survey is completed and we can definitely differentiate between ribes-free and ribes-bearing acreages. The map on page 9 shows in general the distribution of ribes-bearing and ribes-free areas within the white pine growing sections of the region. The map also shows the present control zone boundary incorporating the commercial range of white pine in the region

CONTROL WORK IN 1944

During the calendar year 1944 white pine blister rust control work in the Southern Appalachian Region progressed very well in spite of labor shortages, transportation difficulties and other factors which must be reckoned with during the war emergency. White pine surveys and ribes eradication were conducted on state and private lands, National Forest lands and National Park lands. National Forests on which work was performed were the George Washington in Virginia and West Virginia, the Jefferson in Virginia, the Monongahela in West Virginia, the Pisgah in North Carolina, the Cherokee in Tennessee and the Chattahoochee in Georgia. All initial work and rework was completed on the Pisgah and Cherokee Forests during the year with the result that these two Forests are now on maintenance.

Although there are three more forests in this region namely the Cumberland in Kentucky, the Nantahala in North Carolina and the Sumter in South Carolina no work has been performed on these forests for a number of years. Work will probably be resumed, however, on the Nantahala and Sumter during the 1946 fiscal year and possibly some work on the Cumberland in Kentucky.

On National Park lands control work was carried on in the Shenandoah National Park in Virginia, and that portion of the Blue Ridge Parkway which lies in Virginia. Civilian Public Service labor used on the parks proved quite satisfactory. The CPS workers were supervised either by a regular park employee assigned to blister rust control or by one of our own employees.

SOUTHERN APPALACHIAN BLISTER RUST CONTROL REGION
Ribes-Bearing and Ribes-Free Area in Control Zone

1944

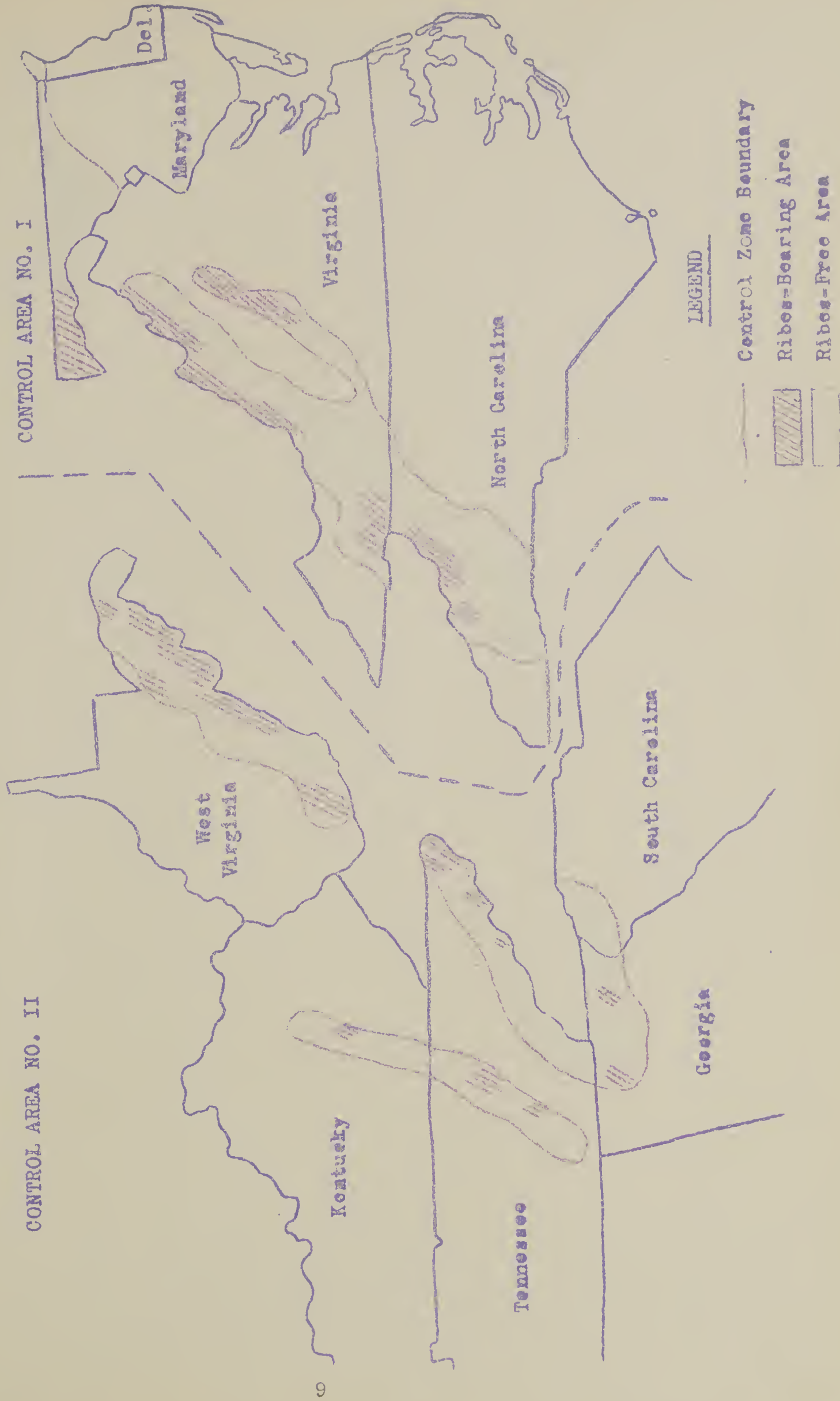


Table I

Summary of Ribes Eradication by Land Ownership in 1944

Land Ownership	Acres Worked on Ribes Bearing Lands				Per Acre			
	Initial	Acres	Third &	Other	Total	1st.	Re-work	Man-Days
	Ribes-	Initial	Second	Working	Working	Work	Work	Re-work
	Free	Work	Working	Working	Working	Work	Work	work
NATIONAL FOREST LAND								
George Wash.	30,520	5,872	6,870	1,726	14,468	25.9	24.4	0.31
Jefferson	22,337	310	511	640	1,461	273.0	125.7	0.75
Monongahela	-	-	3,788	-	3,788	-	2.9	0.24
Chattahoochee	43,544	116	-	-	166	59.6	-	2.04
Pisgah	710	-	1,843	-	1,843	-	9.6	0.25
Cherokee	141,822	230	805	-	1,035	54.6	11.2	0.28
TOTAL								
NAT'L. FORESTS	238,933	6,528	13,817	2,366	22,711	39.2	24.2	0.36
NATIONAL PARK LAND								
Shenandoah	-	180	167	605	952	47.5	20.8	0.40
Blue Ridge	-	-	-	-	-	-	-	-
Parkway	-	180	167	605	180	10.9	-	0.74
TOTAL								
NAT'L. PARK	-	360	167	605	1,132	29.2	20.8	0.57
STATE AND PRIVATE LAND								
Maryland	155	80	220	210	510	88.2	24.1	0.55
N. Carolina	5,186	-	-	833	833	-	9.5	0.20
Virginia	23,908	2,270	-	2,195	4,465	12.4	11.3	0.16
Georgia	29,940	-	135	265	400	-	81.0	1.35
Tennessee	-	-	1,232	-	1,232	-	15.6	0.35
W. Virginia	351	217	12,031	-	12,248	41.2	8.2	0.31
Total								
State & Private	59,540	2,567	13,618	3,503	19,688	17.2	11.3	0.19
TOTAL								
ALL OWNERSHIP	298,473	9,455	27,602	6,474	43,531	32.9	17.7	0.32

Table II

Summary of Ribes Eradication By States and Operating Agencies in 1944

State	Operating Agency	Initial Acres	Initial Ribes-free	Initial Work	Second Working	Third And Other Workings	Total	Ribes Destroyed	Man-Days
Maryland	Bureau	155		80	220	210	510	17,415	125
Bureau		5,186		-	-	833	833	7,900	172
N. Carolina	Forest Serv.	710		-	1,843	-	1,843	17,778	466
Bureau		23,908		2,270	-	2,195	4,465	53,066	660
Virginia	Forest Serv.	52,857		5,931	2,565	2,366	10,862	491,662	3,482
Park Serv.		-		360	167	605	1,132	26,546	509
Bureau		-		-	135	265	400	32,418	542
Georgia	Forest Serv.	73,484		116	-	-	116	6,910	237
Bureau		-		-	1,232	-	1,232	19,191	431
Tennessee	Forest Serv.	141,822		230	805	-	1,035	20,744	96
Bureau		351		217	12,031	-	12,248	108,145	2,427
W. Virginia	Forest Serv.	-		251	8,604	-	8,855	110,887	2,448
Bureau		29,600		2,567	13,618	3,503	19,688	238,135	4,357
Regional	Forest Serv.	268,873		6,528	13,817	2,366	22,711	647,981	6,729
Totals	Park Serv.	-		360	167	605	1,132	26,546	509
TOTALS ALL AGENCIES		298,473		9,455	27,602	6,474	43,531	912,662	11,595

The average cost per acre on ribes eradication by operating agencies is as follows: Bureau of Entomology and Plant Quarantine \$1.25, National Forest Service \$1.75, National Park Service \$1.87, Average regional on initial work \$1.83, rework \$1.44. Total average \$1.53.

Table III

Summary of Expenditures on Ribes Eradication in 1944
(Last half Fiscal Year 1944 and First half Fiscal Year 1945)

	Bureau	State *					
State	(Leadership and Coordination)	Bureau Cooperation	Cooperation (Direct Aid Only)	National Forest Service	National Park Service	Total Funds Expended	
Delaware	21.05	26.91	-	-	-	47.96	
Maryland	246.24	420.65	420.96	-	-	1,087.85	
N. Carolina	2,527.91	4,156.79	2,990.62	3,029.17	-	12,704.49	
Virginia	16,840.50	4,243.89	3,812.28	33,945.67	3,679.72	62,522.06	
Georgia	7,026.64	2,377.58	1,356.56	10,129.11	-	20,889.89	
Tennessee	6,441.76	1,952.33	1,511.92	5,859.01	-	15,765.02	
West. Va.	13,900.94	8,240.30	6,120.18	21,839.06	-	50,100.48	
TOTAL	47,005.04	21,418.45	16,212.52	74,802.02	3,679.72	163,117.75	

*Indirect aid on the part of the various states was valued at \$4,639.22 which brings the total amount expended (cash and contributed services) to \$167,756.97

OTHER ACTIVITIES PERFORMED IN 1944

White Pine Surveys

White pine surveys were carried on in practically all states actually engaged in blister rust control during the year. Much of the survey work was confined to resurveying areas which have not been covered for a number of years. White pine reproduction is becoming well established throughout the Southern Appalachian region and the surveys are revealing a marked increase in white pine acreage as well as an increase in density of stocking. It is interesting to note, however, that most of this new white pine acreage is ribes-free. Out of a total of 307,928 acres surveyed by the grid system 298,473 (97%) acres were found to be entirely ribes-free. This was all initially covered acreage. On resurvey work, much of which was carried on in connection with post checking, out of a total of 177,796 acres 143,693 (81%) acres were found to be ribes-free.

Outside of obtaining good maps and records of white pine conditions in the region our surveys and resurveys are also giving us valuable information regarding definite locations of ribes-bearing areas. This information is extremely valuable in building up future work plans, making area case histories and evaluating work areas according to priority of working.

Checking

Extensive post checks were made in connection with resurveys and many areas have been laid out for ribes eradication in 1945 as a result of these checks. Usually a $2\frac{1}{2}$ percent strip check is made with a 5% check made where

it appears a good representative sampling is not obtained. Regular checks were performed following ribes eradication and in practically all cases the crew work checked out below 25 feet of live stem per acre. A few acres worked late in the fall will be rechecked in the spring of 1945. All regular checks are run on a 5 percent basis to assume adequate coverage. Over 1,500 strip acres were covered by regular checks during the year.

Nursery Sanitation

No nursery sanitation was performed during the year in the region. To check all the nurseries in the region requires a good deal of travel time and since most of the nurseries are raising but very little white pine at the present time it was felt, due mainly to restricted travel limitations, to put this work off until after the war. It is planned to recheck the Forest Service nursery at Parsons, West Virginia in 1945, however, most of the nurseries in the region were found to be originally free of wild and cultivated ribes. We have in the region 45 nurseries, mostly private, which are still on the active list. After the next inspection it is expected that a number of these will be dropped. Through the years a total of 37,823 ribes have been destroyed in the nurseries, 31,984 of which were eradicated from the Parsons Forest Service Nursery.

Canker Elimination

Only one canker elimination program was carried on during the year. This was in a native white pine stand on Forest Service land in the Monongahela National Forest in West Virginia. A total of 1,668 trees were treated on a 19-acre track with an expenditure of 147 man-days. Unless confined to final crop trees in native stands and ornamental or plantations, canker elimination work is often more costly than white pine values involved.

Field Studies

Because of the reduced number of field personnel in the region very little investigative work was done. Instead of spending too much time on this activity it was decided to review all of our past studies and see what values we can derive from the data obtained. As a result, many plot studies were abandoned and only those retained which we feel may be of value either from a control standpoint or from gathering general informative data. Some plots will be retained in the field as demonstration areas, particularly white pine infection plots which can be used to show the general public damage caused by the disease and to show effectiveness of control. It is not planned to do any more extensive field studies in the region until Dr. P. L. Rusden, who is in charge of field investigation and methods studies for the three eastern white pine regions, visits our region in the spring of 1945. It is expected that Dr. Rusden will give us valuable aid in formulating plans for future work of this nature.

The most important field study made during the year was performed by Mr. Ralph W. Welch, in charge of control operations in Area No. 2. This study involved the spread of the rust from a single ribes bush to surrounding white pine. The study revealed that under favorable conditions considerable damage can occur to white pine from one average size ribes bush. Details of this study are set forth in a regional technical memorandum which was widely distributed.

Other technical memoranda were also written mostly based on general observation and data gathered from various field studies. Most of these papers were prepared by Mr. Roy G. Pierce and mainly dealt with ribes regeneration. In general all such studies showed a marked decrease in ribes regeneration between first and subsequent workings. No attempt is made in this report to list and review all of the various reports on ribes regeneration since now it is a known fact that there is no great problem involved in the region with excessive regeneration of ribes either from seeds or sprouting. In a few sections, such as in Garrett County in western Maryland and along the crest of the Blue Ridge Mountains in the Shenandoah National Park we do have considerable regeneration but this represents only a small percentage of the total area in the region.

White Pine Occurrence

Because of the complexity of intermingled forest types in the Southern Appalachians an attempt is being made to classify the various tree type associations which support white pine growth. This work was started in 1943 and continued through 1944. Representative mile square grids are selected on which a complete 5 percent type cruise is made. On each strip cruised diameter data is obtained on each commercial species found in the 0-4, 5-12 and over 12 inch diameter class. Because of the complexity of forest types, type mapping was simplified by placing all oaks in one group, other hardwoods in another group and yellow pines in another. The only individual tree groups listed are white pine, hemlock and chestnut. Chestnuts are recorded either in a dead or dying condition as well as sprout clumps.

Timber typing was confined to five board types recognized as standard by the Forest Service.

Since this study is not yet completed it is impossible at this time to show any definite results or make any definite conclusions. Enough data has been collected, however, to give some idea as to white pine occurrence by diameter classes in association with other forest tree species. On eleven areas surveyed, comprising 7,040 acres, it was found that on an average the 12 inch and over diameter class for all species, white pine averaged 15 percent; in the 5 to 12 inch diameter class 8 percent; and in the 0-4 (reproduction) class 17 percent. The average was based on diameters of white pine on the individual plots ranging from less than one percent to 61 percent in the 12 inch and over diameter class, from 3 to 41 percent in the 5 to 12 diameter class and from less than 1 percent to 40 percent in the 0 to 4 inch diameter class. As was expected the largest percentages in all diameter classes fell in the oak and mixed hardwood types. However, it is interesting to note that white pine comprised the largest number of coniferous trees in all diameter classes within the oak-hardwood types; white pine being 17 percent of the total number of trees, yellow pine 12 percent, and hemlock 3 percent. Chestnut came in with 5 percent of the total

The results so far seem to be significant in one respect; that white pine is holding its own within the mixed hardwood forests of the Southern Appalachians and there is plenty of evidence that white pine is gradually forging ahead to make itself an overall important species within the complex forest types of the region. It is seldom that white pine is found growing

in pure stands. Only in certain restricted areas in northwestern North Carolina, northeastern Tennessee and portions of southwestern Virginia are pure stands of white pine to be found to any great extent. In this section it is often common to find white pine seeding in on old pasture lands instead of the more common scrub yellow pine or scrub oak.

White Pine Production

It is quite difficult under war conditions to obtain accurate figures on lumber production. At present the most reliable figures we have are those furnished by the Southern Appalachian Experiment Station in Ashville, North Carolina.

TABLE IV

Estimated Production of White Pine Lumber in Board Feet
in the Southern Appalachian Hardwood
Region for the Year 1944

STATE ★					
West Virginia:	Kentucky	:	Tennessee	:	S. Carolina : Virginia ? N.Carolina:
:	:	:	:	:	:
:	12,231,000	:	6,573,000	:	17,764,000 : 1,628,000 :45,624,000 :74,866,000 :
:	:	:	:	:	:

★ No information received from Georgia.

In practically all states the production of white pine lumber was greater than in either the previous two years since the war. White pine has been in great demand for crating war materials. Stumpage prices varied greatly, with prices ranging from \$5.00 to over \$20.00 per M board feet.

Increased activities in Federal and State fire control procedures have greatly enhanced the survival and distribution of white pine. White pine is reasonably tolerant and for this reason excellent growth should occur in the next few years as a result of opening up the hardwood stands due to present increased logging operation. Also because of the long growing season, white pine makes record growth in this region. During favorable growing years leaders are known to grow four to five feet in height..

STATUS AND SUMMARY OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1944

Since the beginning of white pine blister rust control work in 1933 a total of 5,994,772 acres have been worked in the region. The estimated control acreage (white pine plus protective zone) for this region is now set at 6,413,287 acres. On a percentage basis, therefore, we have initially worked 93.5 percent of this acreage. Of the 5,994,772 acres initially worked 5,535,233 acres or 92.3 percent have been placed on maintenance. Only 601,183 acres are classed as ribes-bearing, with 5,393,529 acres being found naturally free of wild ribes. A total of 222,894 acres has been reworked one or more times. During the last 12 years 31,748,545 ribes have been eradicated with an expenditure of 286,777 8 hour man-days.

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF THE HISTORY OF ARTS
AND ARCHITECTURE
OFFICE OF THE CURATOR
OF THE MUSEUM OF ARTS
AND ARCHITECTURE
CHICAGO, ILLINOIS

TO THE HONORABLE SENATE OF THE UNIVERSITY OF CHICAGO
FOR THE YEAR 1900-1901
THE CURATOR OF THE MUSEUM OF ARTS
AND ARCHITECTURE
PRESENTS

THE MUSEUM OF ARTS
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The above figures are net figures. Gross figures are somewhat higher but due to reclassification of certain control areas, considerable data has been eliminated from our control records. This has been necessary in order to show a more accurate picture of the present status of control in the region. In the past many acres were worked which were either supporting good white pine at the time and later burned over or logged off, or the acres worked were considered good potential white pine sites which never materialized as such. Also some areas, especially in western Maryland were abandoned because of heavy loss due to blister rust infection where the original work was not done early enough to save the pine. Certain errors in the original survey figures were also found, such as claiming too much acreage because of overlapping control boundaries on adjacent white pine areas. This trouble has been eliminated by confining our control acreage to mile square grids. Table V on page 17 shows the status of ribes eradication by land ownership.

Table V

Status of Ribes Eradication by Land Ownership as of December 31, 1944

Land Ownership	White Pine: In Control Area	Pine & Prot. Area (Zone)	Control	Initially Worked	Initially Unworked	Percent Worked	Initially Unworked	Maintenance: On	Maintenance: Working	Other	Third
National	898,383	1,614,627	1,426,740	88.4	187,837	1,303,788	91.4	54,498	11,200		
Forest Land											
National	62,293	121,856	120,149	98.6	1,707	106,410	88.5	5,964	2,841		
Park Land											
Indian											
Lands	22	445	445	100	-	445	100	-	-		
Total											
Federal											
Lands	960,698	1,736,928	1,547,334	89.1	189,594	1,410,643	91.1	60,462	14,041		
State and											
Private Lands	2033,055	4,676,359	4,447,438	95.1	228,921	4,124,590	92.7	123,887	24,504		
TOTALS											
ALL LANDS	2993,753	6,413,287	5,994,772	93.5	418,515	5,535,233	92.3	184,349	38,545		

Work on National Forest lands has been conducted on nine National Forests within the control boundaries of the region. Four National Forests, namely the George Washington, Jefferson, Monongahela and Cumberland are in Forest Service Region No. 7 while the other five, namely the Pisgah, Nantahala, Cherokee, Chattahoochee and Sumter are in Forest Service Region No. 8. Initial work on the Cumberland and Sumter National Forests was completed in 1934 and on the Nantahala in 1937. In 1944 initial work and rework was completed on the Pisgah and the Cherokee Forests. These Forests are now all on maintenance. Within two more years it is expected that most of the Chattahoochee, Monongahela and Jefferson will be placed on a full maintenance basis. Because of the more extensive acreage on the George Washington supporting ribes and white pine in association, it will probably take more than two years to place this forest on a maintenance basis. Of the total number of forests worked 69 percent of the ribes-bearing lands are on the George Washington National Forest.

Because the grid survey has shown up a marked increase in white pine distribution during the past few years it is highly recommended that a resurvey be made on those forests which have had no work performed on them for a number of years such as the Cumberland National Forest in Kentucky, the Nantahala Forest in North Carolina and that portion of the Sumter Forest lying in northwestern South Carolina.

In our region we have three national Parks, the Shenandoah in Virginia, the Blue Ridge Parkway in Virginia and North Carolina and the Great Smoky Mountains in North Carolina and Tennessee. On the Shenandoah National Park ribes were found heavily concentrated along the crest of the Blue Ridge Mountains and the problem of establishing effective control measures in this Park has been difficult. Ribes regeneration following the various workings has been heavy and infection on white pine made rather rapid headway. It can be said now, however, that good progress has been made, and most of the high priority white pine areas on the Park are adequately protected.

The Blue Ridge Parkway is long and narrow and will eventually be a connecting link between the Shenandoah and Great Smoky Mountains National Parks. Native wild ribes are scarce along the Parkway south from Roanoke, Virginia. Along the northern stretch of the Parkway ribes are more numerous and it was found necessary to conduct ribes eradication on several white pine areas. Although blister rust on white pine has not been found on the Parkway it has been found very close by in one location on private land. South of Roanoke most of the work is confined to cultivated ribes eradication.

On the Great Smoky Mountains National Park the only native ribes found and eradicated which were growing in association with white pine were in the Cataloochee section on the North Carolina side. The area is now on maintenance and probably will be for some time to come. On the Tennessee side, which contains some of the best white pine stands in the Park, no wild ribes were found in any of the pine areas. There is no great blister rust problem in this park.

Approximately 73 percent of the control area in the region is in private ownership. Of this acreage (4,676,359) 4,447,438 has been initially worked of which 92.7 percent has been placed on maintenance. Only 427,501 acres are ribes-bearing on which initial and some rework has been performed. In North Carolina, Tennessee, Kentucky and South Carolina all private and State lands are now virtually on a full maintenance basis. Future work in these states will be confined to white pine resurveys, post checking old ribes areas and

making rechecks for cultivated bushes. In Virginia and West Virginia there is still a good deal of work to be done on private lands, mostly on surveys and ribes eradication. In Georgia it is expected that most of the private lands will be found to be ribes-free as the survey progresses. Although there has been a good deal of work performed in western Maryland, recent checks have revealed a good deal of ribes regeneration. Rework should be performed in this state before too long. No native ribes have been found in Delaware and most of the white pine is planted and control work in this State is confined to periodic checks for cultivated ribes and white pine infection. So far blister rust has been found only on ribe in Delaware.

In this region we only have one Indian Reservation, the Cherokee in North Carolina. Only a small amount of white pine has been found on this reservation and it was found to be free of wild ribes.

For more detailed information on control work on State and Private lands, National Forests and National Parks, please refer to sections III, IV and V respectfully.

Table VI

Summary of Ribes Eradication on Federal Lands as of December 31, 1944

Land	Operation	Initial	First Working	Second Working	All Workings *
Ownership		Ribes- Worked	Average Acres : Ribes : Man-Days	Average Per Acre : Ribes : Man-Days	Average Per Acre : Ribes : Man-Days
National Forest	George Wash.	178,255	110,238 : 20.8 : 0.20	42,831 : 19.8 : 0.24	153,069 : 20.5 : 0.21
Region 7	Jefferson	70,277	19,010 : 67.3 : 0.60	2,940 : 218.0 : 1.20	21,950 : 88.0 : 0.68
	Monongahela	62,513	14,549 : 26.2 : 0.25	9,933 : 4.5 : 0.22	24,482 : 17.4 : 0.24
	Cumberland	30,538	27 : 77.5 : 0.55	- : - : -	27 : 77.5 : 0.55
TOTAL REGION 7		341,583	143,824 : 27.5 : 0.26	55,704 : 27.5 : 0.28	199,528 : 27.5 : 0.27
National Forest	Chattahoochee	244,095	8,270 : 203.4 : 1.03	5,059 : 10.4 : 0.09	13,329 : 130.2 : 0.67
Region 8	Pisgah	148,836	4,614 : 116.0 : 2.20	3,874 : 18.0 : 0.50	8,488 : 72.0 : 1.50
	Nantahala	47,246	- : - : -	- : - : -	- : - : -
	Cherokee	481,337	3,235 : 607.9 : 2.56	1,061 : 9.8 : 0.15	4,296 : 460.2 : 1.96
	Sumter	3,700	- : (1) : -	- : - : -	- : (1) : -
TOTAL REGION 8		925,214	16,119 : 259.5 : 1.67	9,994 : 13.3 : 0.26	26,113 : 165.3 : 1.13
TOTAL FOREST SERVICE		1,266,797	159,943 : 50.9 : 0.40	65,698 : 25.4 : 0.28	225,641 : 43.5 : 0.37
National Parks	Shenandoah	1,580	12,165 : 154.0 : 1.46	8,344 : 89.0 : 1.44	20,509 : 127.0 : 1.45
	Blue Ridge				
	Parkway	5,922	1,047 : 14.9 : 0.45	- : - : -	1,047 : 14.9 : 0.45
	Great Smoky				
	Mountains	98,908	527 : 154.0 : 2.90	461 : 51.0 : 1.40	988 : 117.0 : 2.20
TOTAL PARK SERVICE		106,410	13,739 : 143.4 : 1.44	8,305 : 87.0 : 1.43	22,544 : 121.3 : 1.43
Indian Reservations	Cherokee	445	- : - : -	- : - : -	- : - : -
TOTAL FEDERAL LANDS		1,373,652	173,682 : 58.2 : 0.48	74,503 : 32.6 : 0.42	248,185 : 50.5 : 0.46

*Only ribes-bearing acreage included under workings
(1) Cultivated ribes only

Table VII

Summary of Ribes Eradication on State and Private Lands as of December 31, 1944

State	Initial Acres - Ribes- Free	First Working		Second and Other Working		All Workings	
		Average Per Acre: Ribes	Man-Days	Average Per Acre: Ribes	Man-Days	Average Per Acre: Ribes	Man-Days
Delaware	4,682	-	(1)	-	-	-	-
Maryland	137,086	35,781	87.0	37,557	16.0	73,338	51.0
N. Carolina	1,422,256	9,482	181.0	6,883	38.0	16,365	121.0
Virginia	591,482	111,932	15.0	21,307	14.0	133,239	15.0
Georgia	287,178	4,512	281.7	4,009	76.8	8,521	185.3
Kentucky	50,000	-	(1)	-	-	-	-
Tennessee	1,040,720	29,257	124.7	13,657	28.2	42,914	94.0
S. Carolina	25,935	-	(1)	-	-	-	-
W. Virginia	460,598	236,537	20.7	64,978	6.2	301,515	17.5
TOTAL	4,019,937	427,501	38.4	148,391	12.7	575,892	31.8
			0.28		0.23		0.27

*Only ribes-bearing acreage included under workings

(1) Cultivated ribes only

PART III

Work Project BLR 3-2

Detailed Reports on Blister Rust Control on
State and Private Land - 1944 *

By

Henry E. Yost, P-3, Area Leader, Area No. 1

H. B. Teague, P-2, Assistant Area Leader

Ralph W. Welch, P-3, Area Leader, Area No. 2

W. V. Zimmer, P-2, Assistant Area Leader

* These Reports Include Summaries of All
Control Work by States and are to be
Issued as Separate State Reports to
the Cooperators

WHITE PINE BLISTER RUST CONTROL

IN THE

STATE OF DELAWARE

1944

BLISTER RUST CONTROL AREA NO. 1

Henry E. Yost - Area Leader

H. B. Teague - Assistant Area Leader

INTRODUCTION

No material change has taken place regarding the status of blister rust control in Delaware during the year. The following reorganization of the Southern Appalachian Region was placed into effect during the year. From 1933 through 1943 the work in each state was in charge of a state leader who was responsible to the Regional Office, which was in Richmond, Virginia. The Regional Office is now located in Harrisonburg, Virginia, and the Region is divided into two areas as follows.

Area No. 1

Delaware
Maryland
District of Columbia
Virginia
North Carolina

Area No. 2

West Virginia
Kentucky
Tennessee
Georgia
South Carolina

Mr. Roy G. Pierœ retired during the year and was succeeded by Mr. J. Curtis Ball, whose address is 401 News Record Building, Harrisonburg, Virginia. The office for Area No. 1, however, remains in Room 317 Federal Building and the address is Box 507, Harrisonburg, Virginia.

Due to the scarcity of personnel and the necessity of concentrating our efforts in sections of heavy blister rust infection, no field work was carried on in the State this year. The status of the work, therefore, is the same as last year or as follows:

Table I

Status of Blister Rust Control as of December 31, 1944

:White Pine:	Control:	Control :	Control :	Total :	Total:	Percent :	Acres :
:In Control:	Acreage:	Acreage :	Acreage :	Ribes :	Man :	Initial :	On :
: Area :	In :	Initially:	Reworked:	Des- :	Days :	Work :	Mainten-:
: (Acres) :	State :	Worked :	:	troyed:	:	Completed:	ance :
:	:	:	:	:	:	:	:
: 214 :	: 4,682 :	: 4,682 :	: - :	: 4,113 :	: 368 :	: 100 :	: 4,682 :

The 214 acres of white pine are plantations in New Castle County and native stands in Kent and Sussex Counties.

In addition to the above there are several thousand ornamental white pine trees, principally in the vicinity of Wilmington. Nothing approaching a complete check on white pine plantations has been made since 1940. Therefore the above figures are out of date by about four years. Blister rust has been found in several locations on cultivated ribes in the State since 1937 but no extensive damage is known or believed to have occurred to date. The situation is not believed to be critical at present, however, it is

necessary that some scouting be carried on frequently and probably further work will be required.

BLISTER RUST CONTROL REGULATIONS IN 1944

While no field work was carried on during the year, the State, by establishing a quarantine on ribes plants, has taken a step of major importance. Effective May 15, 1944, rules and regulations were promulgated by the State Board of Agriculture which practically prohibits the planting of ribes plants in the northern part of the State and restricts the planting of them in the southern part. Other provisions are also included which provide for the destruction of these plants now growing and other phases of the problem. There was published, together with the rules and regulations, a list of towns and communities wherein the importation of ribes would be prohibited and a similar list wherein they may be permitted.

QUARANTINE REGULATIONS

The following summary of the operation of the quarantine during the calendar year of 1944 was submitted by Mr. S. L. Hopperstead, State Plant Pathologist, which shows very effective work by the State and excellent cooperation on the part of individuals.

	<u>No. of Persons</u>	<u>No. of Ribes Bushes</u>
Requested	19	71
Rejected	2	7
Granted	17	64 (all prior to May 15)
Granted but not shipped or planted (voluntary cooperation by owners)	16	61

The quarantine did not go into effect until after May 15, 1944, at which time the bulk of shipping was over. Prior to that date it was not possible to reject shipments and only two requests were received after that date. No doubt some planting was done which we have no knowledge but the number of these cases was undoubtedly small.

A large percentage of the ribes near white pine was destroyed in the past. This quarantine is the most effective way to prevent extensive planting of the bushes. Sometime during the post war period the problem should be reconsidered and if found necessary, an attempt made to complete the eradication of the remaining ribes bushes.

WHITE PINE BLISTER RUST CONTROL

IN THE

STATE OF MARYLAND

1944

BLISTER RUST CONTROL AREA NO. 1

Henry E. Yost - Area Leader

H. B. Teague - Assistant Area Leader

INTRODUCTION

No material change has taken place regarding the status of blister rust control in Maryland during the year. The following reorganization of the Southern Appalachian Region was placed into effect during the year. From 1933 through 1943 the work in each State was in charge of a State Leader who was responsible to the Regional Office, which was in Richmond, Virginia. The Regional Office is now located in Harrisonburg, Virginia, and the Region is divided into two areas as follows:

Henry E. Yost - Area Leader
Area No. 1

Delaware
Maryland
District of Columbia
Virginia
North Carolina

Ralph W. Welch - Area Leader
Area No. 2

West Virginia
Kentucky
Tennessee
Georgia
South Carolina

Mr. Roy G. Pierce retired during the year and was succeeded by Mr. J Curtis Ball, whose address is 401 News Record Building, Harrisonburg, Virginia. The office for Area No. 1, however, remains in Room 317 Federal Building and the address is Box 507, Harrisonburg, Virginia.

STATUS OF CONTROL

During the year there was only a slight overall change in the general status of the blister rust control problem in the State. A small amount of ribes eradication work was performed on lands owned by the Department of Forests and Parks.

Table I

Status of Blister Rust Control Work as of December 31, 1944

White Pine:	Control:	Control:	Control:	Total	:	Total:	Percent	Acres	:
Acreage In:	Acreage:	Acreage:	Acreage:	Ribes	:	Man	Initial	On	:
Control	In The	Initially:	Re-	Destroyed:	Days	Work	Mainten-		:
Area	State	Worked	worked	:	:	Completed:	ance		:
:	:	:	:	:	:	:	:	:	:
:	72,973	175,156	172,867	37,557	3,792,402	21,168	99	154,406	:

*The term "Maintenance" is used to designate lands on which no wild ribes were found or where they have been reduced in number to a point where no further eradication will be required for 5 to 10 years or more.

Less than 1,000 acres, out of approximately 36,000 acres of ribes-bearing control area in the State, has been reworked since June 30, 1943. During

this three and one-half year period no doubt the ribes have continued to come back, resulting in the spread and intensification of the disease. In February 1942, work plans were submitted to the State Plant Pathologist and State Forester outlining the estimated needs to maintain control for the State for the period of 1942 to 1945, inclusive. The following shows the acreage scheduled for work, and that worked through 1944 by ownership:

Table II

Acres Worked and to be Worked By Land Ownership

Year	State Owned		Private Owned	
	Acres to Work	Acres Worked	Acres to Work	Acres Worked
1942	1,900	123	3,190	-
1943	1,260	120	2,768	-
1944	775	635	2,510	-
TOTAL	3,935	878	8,468	-

Inspections of several State-owned plantations and native stands of white pine in December 1943 and during 1944 indicated that the disease is making rapid progress, and in some locations ribes are coming back with equal rapidity.

The map on page 29 shows the status of control work in the state as of December 31, 1944:

BLISTER RUST CONTROL WORK IN 1944

Close cooperation between the Department of Forests and Parks and the Bureau made it possible to do a small amount of ribes eradication during the Spring of the year. All work was confined to high priority plantations on State-owned land on the Savage River State Forest in Garrett County. The quality and quantity of labor left much to be desired but we were fortunate to secure the services of Mr. D. W. Norris as foreman. The cost per acre was somewhat high due to the present wage rates but the quality of the work was excellent. The usual methods were employed; i.e. a five-man crew and foreman. Much emphasis was placed on the use of the salt-borax mixture on ribes roots that could not be readily removed. The table on page 30 shows the location and results of the work:

LEGEND

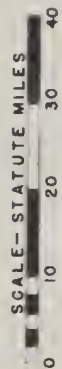
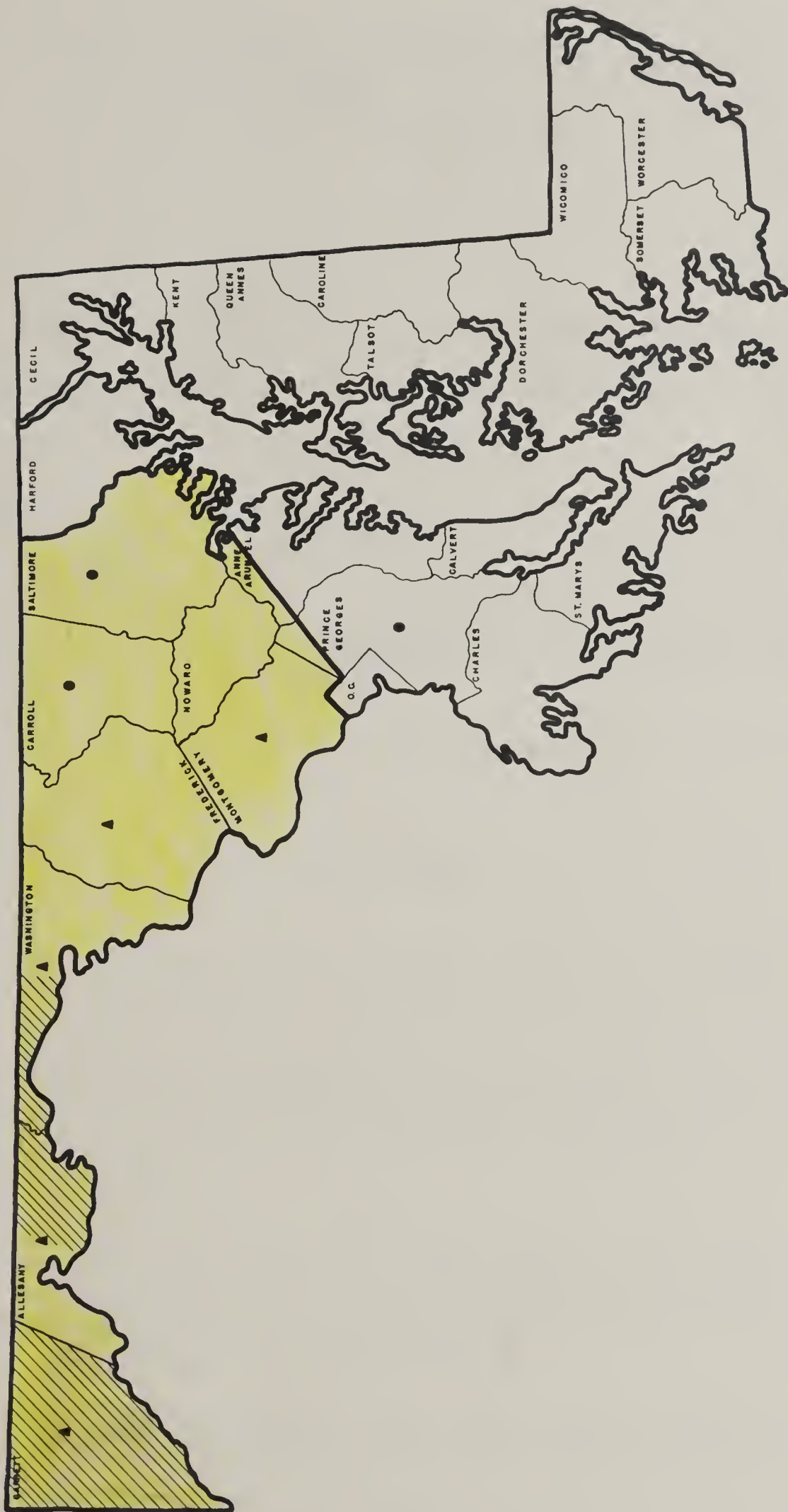
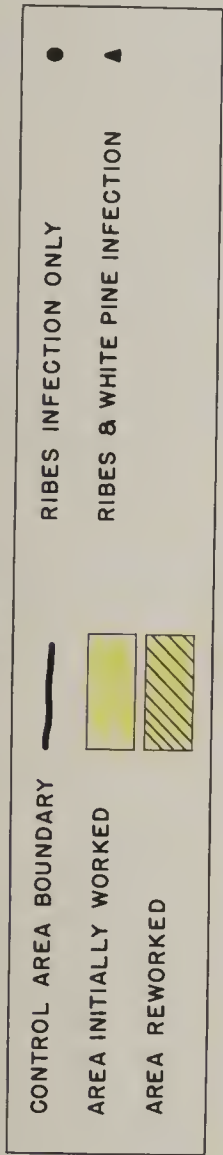


Table III

Summary of Ribes Eradication in Maryland in 1944

Name of Area Worked	Acres:		First Working			Other Working		
	Ribes:	Acres:	Total	Ribes:	Man:	Acres	Ribes:	Man:
	Free	Worked:	Acres	Des- :Covered:	Days:	Worked:	Des- :troyed:	Days:
Wisserman Place	-	25	25	5,864	15	210	5,072	31
Greene Place	-	-	-	-	-	220	5,285	50
Fellinger Place	155	55	210	1,194	29	-	-	-
			(1)					
TOTAL	155	80	235	7,058	44	430	10,357	81

(1) Includes ribes-free and ribes-bearing lands

The initial work on the Wisserman Place was believed necessary because of the peculiar topographic and climatic conditions that are present. This represents an extension of the control zone to a width of about 1,100 feet on one side. A detailed study was made of this area and reported in Technical Memorandum No. 14, Observations Regarding the Spread of White Pine Blister Rust Following Ribes Eradication in White Pine Plantations in Garrett County, Maryland. By H. E. Yost, November, 1944.

Each of the areas were checked and the quality of the work found satisfactory.

WHITE PINE

White pine is one of the most valuable timber species found in western Maryland. It is particularly suitable for planting and is widely used by the State Department of Forests and Parks as well as the Soil Conservation Service and other agencies. During the decade ending 1943, the average annual cut of white pine in Maryland was approximately 325,000 board feet. The average value f.o.b. mill was about \$25.00 per 1,000 ft. No data is available for 1944 but in all probability the value and volume are both well above the average.

Since the beginning of the war the planting of white pine has no doubt been reduced almost to the vanishing point but during the decade ending 1942, about 750,000 white pine seedlings were planted annually. This, no doubt, will be resumed after the war when more labor will be available and more land now being farmed will be abandoned.

The heavy wartime cutting for lumber and pulpwood will no doubt release much white pine reproduction as well as induce additional seeding in of

white pine. This is particularly true in Allegany and Washington Counties where most of the white pine was of the reproduction class.

The 1937 annual report gives a more detailed description of the white pine distribution in the State. The situation in general has changed but little since that time.

PERSONNEL

Despite the almost universal cry that no men are available, we were able to find a crew containing a few good men. The Department of Forests and Parks was able to release Mr. D. W. Norris to supervise the crew. Mr. A. C. Wallis, the Department's towerman at Negro Mountain Fire Tower, although inexperienced in blister rust control work, developed into a good sub-foreman. The others were local men or boys. With careful training and close supervision, Mr. Norris soon had a fairly good crew. Care was exercised to see that no valuable men were taken from essential industry. Experience in Maryland, as well as other States, indicated that in most cases men are available without "raiding" essential jobs of their workers. It is our policy throughout the Region to cooperate in every way possible to relieve the overall man power problem.

FIELD STUDIES

A study of infection conditions, previously mentioned in this report, is the only work begun this year. Several years ago, two plots were established near Swallow Falls to observe the progress of the blister rust where no control is practiced. These observations are being continued and are nearing completion. The same is true of some studies on the regeneration of ribes following eradication work. In 1942 a study was begun on the Green Ridge Station Forest to observe the amount and distance of blister rust infection resulting from different sizes and species of ribes. The first observation of the results will be made in the Spring of 1945. No additional field studies are now contemplated for the duration of the war.

COST OF BLISTER RUST CONTROL WORK IN 1944

The following table gives a resume of the cost and the work performed during the year.

Table IV

Cost of Control Work in 1944

:	:	Amount	:	Balance	:	:	:	:	:
:	Operating:	Expended:	:	Available:	:	Cost Per Acre			
:	Agency	:	1/1/44-	:	1/1/45-	:	Ribes Eradication		Survey
:	:	:	12/31/44:	:	6/30/45	:	Initial Work	Rework	:
:	Md. Dept.:	:	:	:	:	:	:	:	:
:	Forests &:	:	:	:	:	:	:	:	:
:	Parks	:	420.96	:	1,000.00:	:	-	-	-
:	Bureau of:	:	:	:	:	:	:	:	:
:	Ent. &	:	:	:	:	:	:	:	:
:	Pl. Qua.	:	420.65	:	1,190.00:	:	-	-	-
:	:	:	:	:	:	:	:	:	:
:	TOTAL	:	841.61	:	2,190.00:	:	3.71	1.27	-

The balance available as shown in the above table is that part of the allotment for the last half of Fiscal Year 1945 ending June 30, 1945, which was not spent up to December 31, 1944. The cost per acre values are based on total cooperative funds (Federal and State) since there is no practical way of segregating acres and man-days worked by agencies where the work is intermingled as one project.

RECOMMENDATIONS FOR FUTURE WORK

The following recommendations are made with the hope that enough interest will be aroused to bring about an understanding of the necessity and need of continuing blister rust control operations in Maryland. Too much time has already elapsed between workings and if adequate protection is to be maintained it is urged that due consideration be given to these recommendations.

1. Current Plans

There is no known reason, at present, to make any marked change in the work plan prepared in February 1942. An examination of a few areas in December 1943 indicated the desirability of discontinuing control work on some of the pine because of a high cost of maintenance or a heavy loss from the rust of both.

A. Checking

A check should be made of all the ribes bearing control areas in the State and data taken on the density and distribution of the ribes and pine. At the same time observations should be made regarding the extent of blister rust infection. Each area should then be considered and control work resumed or the area discontinued from a blister rust control standpoint. This check should be made during the period of April 15 to June 15. Four experienced

men would be able to cover most or possibly all of the more important areas in one season. About one-half of this time will be required on State-owned lands.

B. Ribes Eradication on State-owned lands

The above mentioned work plan provided, for the period 1942-1945 inclusive, for a total of 4,135 man-days. During this period the areas worked eliminated 425 man-days and areas which were tentatively discontinued accounted for 200 man-days, which leaves 3,510 man-days work due or past due for 1945. To do all of this work in one season would require approximately 90 men for two months and some \$15,000.00 to \$18,000.00 at the present wage rates. It is evident therefore that an abundance of necessary work is available to take care of any amount of funds and manpower that will be forthcoming, even if several additional areas are discontinued.

The present fund of \$2,190.00 should be used in checking if experienced men can be found for next Spring, particularly on the Green Ridge State Forest. If not, a crew should be used on ribes eradication on the Potomac and Swallow Falls Forests. If the location of available labor makes it necessary, they can be used on the Savage Riger State Forest.

C. Ribes Eradication on Privately-owned Lands

A work plan for privately owned holdings subdivided the State into three areas based on the relative abundance of wild ribes and white pine. This was submitted to the State Plant Pathologist in 1941. Another plan, showing details covering only the westernmost area, was submitted in February 1942. This provided for a total of 3,130 man-days for the period of 1942 to 1945 inclusive. The requirements for the other two areas of the State combined will be approximately equal. No work was performed on these lands during this period. No information is available as to the rate of ribes regeneration or the intensification of the disease on pine. It can be safely assumed that the need for control work becomes greater each year because of the lapsed time involved since any work has been performed. Probably some areas are already severely damaged by the disease. At least 5,000 man-days labor, at a cost of \$20,000.00 to \$25,000.00 could be used next year. Again it is certain that all labor and money that can be made available could be used effectively.

II. Post War or Long Range Plans

- A. The present regulations relative to the quarantine of cultivated ribes should be continued as in the past.
- B. The white pine blister rust must be regarded as a major factor in the forest management of white pine. In western Allegany and Garrett Counties no white pine should be planted until a close examination of the planting site and its surrounding control zone has been made. Where wild ribes are abundant, which will be over much of this area, some other species should be planted. The same principle applies to a lesser extent in the

remainder of Allegany, Washington and northwestern Frederick Counties.

- C. From a blister rust standpoint the planting of white pine should be vigorously encouraged in that part of the State east of the Catoctin Mountains. Many excellent white pine planting sites, which are ribes-free, are found as far west as Cumberland. This work should be carried on by the State Department of Forests and Parks and cooperating agencies such as, the Extension Service, Soil Conservation Service, Vocational Agriculture Schools and others.

WHITE PINE BLISTER RUST CONTROL
IN THE
STATE OF NORTH CAROLINA
1944

BLISTER RUST CONTROL AREA NO. 1

Henry E. Yost - Area Leader

H. B. Teague - Assistant Area Leader

INTRODUCTION

During the latter part of 1943 and the early part of 1944 the Southern Appalachian Blister Rust Control Region was divided into two areas. North Carolina is in Area I which includes also Delaware, Maryland and Virginia, under the supervision of Mr. H. E. Yost, Area Leader, with headquarters in Room 317 Federal Building, Harrisonburg, Virginia. Assistant Area Leader H. B. Teague was stationed in Boone, North Carolina until October, 1944, and is now located in Room 1, Leggett Building, Wytheville, Virginia.

Blister Rust Control work was started in North Carolina in 1933 under the direction of Mr. Roy G. Pierce, Regional Leader, with the first work being done on Federal lands by ECW personnel. In 1934 work was begun on privately owned lands and from then through 1944 annual operations were carried out by the CCC, WPA and Regular programs. The State assisted with the work during the period of 1934 to the present and made substantial cash allotments, beginning in 1937. These allotments have been continued and comprised about one-half of the Regular-Cooperative program which works State and private lands.

In September 1944 Mr. Pierce retired and was succeeded by Mr. J. Curtis Ball. The regional Headquarters were moved in October from Richmond, Virginia to the News Record Building, Harrisonburg, Virginia.

During the 12 summers of Blister Rust Control work in North Carolina over six million acres of area have been inspected in over 25 western North Carolina counties. Vast numbers of home and garden sites have been inspected for cultivated ribes (Current and gooseberry bushes) with 675,355 bushes being destroyed. On native white pine areas 2,018,183 wild ribes have been pulled.

In 20 of the 25 white pine growing counties all white pine areas are on maintenance with the majority of the control acreage in the remaining 5 counties also on maintenance. The entire control acreage of about 1,660,000 acres has been initially worked and most of the native ribes-bearing areas have been worked two or more times with over 99 percent being placed on maintenance. The status of control work as of December 31, 1944 is shown in table I and on the status map on page 38.

Table I

Status of Control Work in North Carolina as of December 31, 1944

White Pine:	Control	: Control	:Control:	Total	: Total:	Percent	: Acres	:
Acreage In:	Acreage	: Acreage	:Acreage:	Ribes	: Man	: Initial	: On	:
Control	: In The	:Initially:	Re-	:Destroyed:	Days	: Work	:Maintenance:	:
Area	: State	: Worked	:worked :			:Completed:	(2)	:
:	:	(1)	:	:	:	:	:	:
: 709,430	:1,659,994:	1,659,994:	11,218:	2,693,538:	55,207:	100	: 1,645,731	:

(1) Of the 1,659,994 acres initially worked, 1,645,361 acres are ribes-free.
1,431,738 acres initially worked are on State and private lands.

(2) Acreage is placed on maintenance when it is considered to be free of ribes or will require no further working in 5 to 10 years from date of last working.

SUMMARY OF BLISTER RUST CONTROL WORK IN 1944

All Blister Rust Control work in North Carolina during 1944 was accomplished by Regular projects. The State and Bureau cooperated on survey, post checking, and ribes eradication on private lands, the Forest Service project included checking and ribes eradication on the Pisgah National Forest and a survey was made of the Deep Creek area of the Great Smoky Mountains National Park.

The Regular-Cooperative project operated in Avery and Mitchell Counties. The Forest Service project was confined to the northern part of Mitchell County. All survey work in the National Park was in Swain County.

Almost all of our workers were part time farmers, working with us only when they did not need to be cultivating their crops.

It was noticeable from the 1944 work that there is a continued increase in white pine reproduction, and that some white pine plantations were established even with current labor shortages. There was also a noticeable decrease in the size and number of ribes bushes found in the sections worked, as compared with conditions existing at the initial working.

Three nurseries were worked in Avery County in connection with our work on privately owned lands.

Work performed on private lands was financed jointly by the State and Federal agencies with supervision being furnished by the Bureau of Entomology and Plant Quarantine. The Bureau also furnished technical supervision for work done on the Pisgah National Forest and assisted in training the mappers in the Great Smoky Mountains National Park. Funds for the work performed on Federal lands was furnished by the respective Agencies. Work on the National Park was by Civilian Public Service Laborers.

White Pine Survey

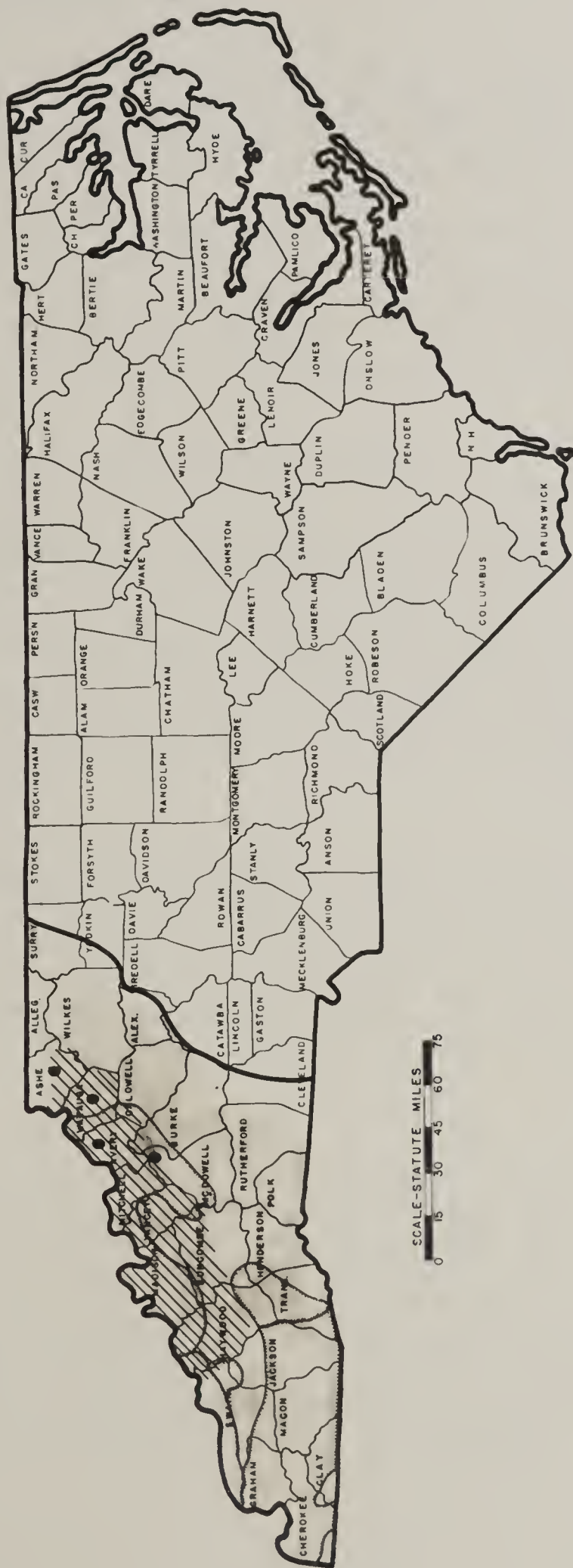
All survey work was accomplished by the grid system, (by square mile

WHITE PINE BLISTER RUST

CONTROL STATUS MAP

STATUS AS OF: DEC. 31 1944
MONTH DAY YEAR

STATE: NORTH CAROLINA



LEGEND

—	CONTROL AREA BOUNDARY
- - -	NATIONAL FOREST BOUNDARY & PARK
□	AREA INITIALLY WORKED
▨	AREA REWORKED
•	RIBES INFECTION ONLY
▲	RIBES & WHITE PINE INFECTION

SCALE-STATUTE MILES
0 15 30 45 60 75

units) with 2-man crews covering 2.5 percent of the area. One man paced for distance and used a hand compass for determining the direction, and the other member of the crew counted the white pines on the strip which was 1/4 chain wide. Strip lines were run north and south in most sections.

Ribes Eradication Crews

Ribes eradication crews consisted of 3-5 men according to working conditions to give greater efficiency. The men worked abreast at distances from 6-20 feet depending on the density of the underbrush, size of the ribes bushes being found, and the concentration of the ribes.

Prior to ribes eradication of any areas, checking crews covered them to ascertain what part of the area contained enough ribes to make a reworking necessary. From the checking maps ribes eradication work plans were made and the crew foremen instructed where to work. Following ribes eradication, checking crews again covered the area to see if the eradication had been thorough and complete.

Ribes Regeneration on Second Working

Ribes comeback was found to be generally light, with dry weather and a closing forest canopy suppressing the ribes present and probably reducing the development of seedlings. However, one interesting case of ribes reproduction was found in a moist spot near Anthony Lake in Avery County where a large bush when eradicated, 158 seedlings were found within an area of 12 square feet. The seedlings were examined and it was found that 37 were 2 years old, 52 were one year old, and 69 had grown in 1944. The above points out clearly the necessity of removing ribes bushes before they reach the seed bearing stage.

Since all of the areas had been worked previously, most of the ribes areas contained only scattered bushes. The average number of bushes per acre was 9.5 over 2,676 acres, as compared with 115 bushes per acre over 14,633 acres of initial work. Although data has not been kept on the amount of feet of live stem pulled per acre, the reduction in live stem footage has been even greater than in number of bushes; for the average size of bushes on reworking is smaller than of the original working.

Checking

Checking crews of both 1 and 2 men were used, with 2-man checking crews being used in most of the sections. The checking was done in the same manner as white pine surveys except that the checkers were counting ribes and recording the number of bushes and feet of live stem instead of white pine. Checking over some areas covered 2.5 percent and on others 5 percent, depending on the distribution pattern obtained by the 2.5 percent check. Strip checking gives a uniform sampling of the area covered. Off-strip sample check strips were made on questionable areas to make certain that no ribes-bearing areas were overlooked.

Table II

Summary of Ribes Eradication in 1944

Operating Agency	Acres		First Working		Other Working	
	Ribes	Free	Acres	Ribes	Acres	Ribes
			Destroyed	Days	Destroyed	Days
Bureau & State						
(State and						
Private Lands)	5,186	-	-	-	833	7,900
Forest Service						
Pisgah	-	-	-	-	1,843	17,778
Forest Service				(1)		
Nantahala	710	-	-	-	-	-
TOTAL					(2)	
ALL AGENCIES	5,896	-	-	-	2,676	25,678

(1) Worked by agent (white pine plantation)

(2) Of the 2,676 acres reworked, 1,843 acres were second working and 833 acres third or more workings.

WHITE PINE - OCCURRENCE, USE, PRODUCTION

White pine occurs naturally in commercially important stands in most of the mountain counties of North Carolina and extends into the western part of the Piedmont Region. Being one of the highest valued timber trees in the mountains, it furnishes income to several thousand people each year.

The uses of white pine are many and varied. The wood is soft, strong, easily worked, and is light, making it desirable for use in the construction of buildings, crates, paper, airplane patterns, window sashes and doors. It has been used by land owners for shingles to cover farm buildings. White pine bark is collected and sold to make extract for cough syrup; white pine is used extensively for Christmas trees and many nurseries in western North Carolina carry substantial supplies of white pines for sale as ornamentals. One nurseryman reported in 1944 that he was increasing his nursery stock from about 5,000 to 20,000 trees during the next two years.

In general white pine has increased rapidly in North Carolina during the past decade, and surveys during 1944 indicated that it is still on the increase. This is due to several factors, including opening of the forest canopy by the death of blighted chestnut trees, increased lumber production which has caused other mature species to be cut and increased fire protection on the part of the State and Federal Agencies. There was also a very large increase in white pine plantations in North Carolina during the period of 1934 to 1940 from about 100,000 trees annually to over 1,000,000 trees per year. Even with wartime labor shortages, there was about a quarter of a million white pine trees planted in western North Carolina during 1944. These trees

were produced by nurseries of the State Forest Service and the Tennessee Valley Authority and were distributed through the County Farm Agents.

The main use of white pines in reforestation is to retire eroded and gullied land from cultivation, pasture, or wasteland to a productive forest state, at the same time building up the land and stopping erosion. Nearly 1,000 private land owners have planted white pine in about 30 counties since 1934. Many owners use white pines in this manner to comply with AAA requirements and receive parity payments in addition to improving their land. After the crop matures in 50 to 60 years, they will have a crop which can be used for farm building, or which can be sold for a cash income. For an example of the use of white pine for wasteland, refer to the report by Mr. S. T. Henry which was included in the 1943 annual report.

Definite progress has been made in recent years toward giving white pine a leading role in timber production in North Carolina. Many Federal, State, and Private organizations are cooperating together, including the State Forest Service in the production of white pine seedlings and giving fire protection; the Tennessee Valley Authority by producing white pine seedlings and assisting land owners in planning a selective cutting program; the State Extension Forester by showing land owners how to remove cull trees and low quality species, favoring the high quality, fast growing trees; the County Farm Agents, as well as many privately owned sawmills and other wood-using industries.

The estimate of white pine lumber cut in North Carolina in 1944 as made by the U. S. Forest Service in cooperation with the Statistical Division, War Production Board is 59,904 M board feet as compared with 38,625 M board feet in 1942. This is an increase of over 21,000 M board feet or 55% over the 1942 cut. The estimated mill value was between \$40.00 and \$45.00 per thousand.

With 99 percent of the white pine growing areas now on maintenance in North Carolina, it is heartily recommended that private land owners be encouraged to continue planting white pine on worn out land.

In the spring of 1944 some of the blister rust control workers in Mitchell County learned that they could secure white pine seedlings from the County Farm Agent. The men applied for seedlings and within a week the first shipments arrived. The seedlings were planted during the latter part of March, and in July each man reported that his trees were doing well. Most of the men said that they planned to plant additional white pines in the spring of 1945. The areas planted ranged from 1 acre to 4 acres in size.

Ribes In North Carolina

Ribes occur on most of the higher mountains in western North Carolina and the occurrence diminishes on lower elevations. On Mt. Mitchell at an elevation of over 6,600 feet native ribes are generally found. The lowest point at which ribes have been found is along the Nolichucky River in Mitchell County at 1,900 feet. White pine grows at elevations ranging

from 1,000 feet to 4,000 feet, so the upper limit of white pine is some 2,600 feet below the highest point where ribes occur, and the heaviest concentrations of ribes are above the white pine range. Over 90% of the white pine areas in North Carolina are free of native ribes. In white pine areas associated with wild ribes it has been noticed that due to rapid growth of the white pine the ribes are becoming suppressed through the closing in of the forest canopy.

Table III

A Comparison of Ribes Eradication in the Different Regions of the Country for 1943

: Region :	Total Acres Worked :	Total Ribes Destroyed :	Man Days :	Per Acre :	
:	:	:	:	Ribes :	Man-Days :
:Northeastern :	368,727:	2,574,503:	28,287 :	6.9 :	0.08 :
:N. Central :	109,219:	2,061,192:	15,490 :	18.9 :	0.14 :
:Northwestern :	36,747:	3,790,528:	47,098 :	103.1 :	1.28 :
:Pacific Coast:	64,594:	6,873,048:	50,115 :	106.4 :	0.77 :
:Southern :	:	:	:	:	:
:Appalachian :	562,627:	817,615:	10,191 :	1.4 :	0.02 :
:	:	:	:	:	:
: TOTAL :	1,141,914:	16,116,886:	151,181 :	14.1 :	0.13 :

To date in North Carolina 1,671,212 acres were worked using 55,207 man-days labor eradicating 2,693,538 ribes, or 1.6 bushes per acre and 0.03 man-days per acre. (See Table I - Status of Control as of December 31, 1944)

PERSONNEL

The 1944 personnel included one permanent appointee, one agent under L/A appointment, two clerks for four months and one clerk thereafter. Both clerks were paid from State funds. At the peak of the season 15 laborers were employed.

Labor during 1944 consisted of farmers who had crops for their own consumption. Each man took off sufficient time to look after his crops, and worked with us during his "off" time. Usually the men scheduled their "off" time so that the entire crew would take off from 2 days to a week at once. Those who could not complete their farm work during that period would remain off until they were able to return. The time off each month varied from 10 to 60 percent, depending on the amount of farm work each required.

FIELD STUDIES

Within the past 4 years several studies have been made to increase efficiency of blister rust control work. With T.V.A. maps available, it was found possible to eliminate the running of base lines and tie-in strip

lines with streams, roads, and other topographical and cultural features. This reduced the cost of survey work by approximately 50 percent. Ribes eradication crews were reduced in size from seven to ten men to a more efficient organization of 3 to 5 men. It was found that applying a 4 ounce dose of salt and borax to broken roots and crowns of ribes bushes that sprouting was greatly reduced. It was also found that by cutting off large bushes flush with the ground and applying salt and borax that time and money was saved in the actual eradication of ribes.

Several ribes regeneration study plots were established in 1940 and 1941. We now have 9 plots in 5 counties, all of which have had two inspections. Another inspection is planned for the spring of 1945 or 1946, at which time it is expected to get some conclusive data on the rate of comeback of ribes, the rate of growth under different shade conditions, a good estimate of the death rate of seedlings under normal conditions, and an estimate of the time that a given ribes area can be left from one working to another. Subsequent studies will reveal the length of time required for a seedling to grow to the fruiting stage.

Another time saver which was tried in Virginia and will be used in future North Carolina survey work is to reduce the number of men in survey crews from 2 to 1 and to record survey data directly to the base maps. This type of mapping is adapted to private lands where the timber is in woodlots, rather than in large forest areas, and is confined to sections for which we have the T.V.A. type of base map showing forest cover.

NURSERY SANITATION

Nursery sanitation work has been conducted in all of the white pine growing nurseries in western North Carolina. Excellent cooperation was obtained from the nurserymen who gave up their cultivated ribes. Three nurseries in Avery County had native ribes growing on the premises, namely the Anthony Lake Nursery at Pineola; Mr. E. C. Robbirs, Pineola, and the Linville Nursery, Linville, N. C. Another reworking was performed on these nurseries in 1944, and Mr. Sam K. Mortimer, owner of the Anthony Lake Nursery said that he would be glad to take over nursery sanitation work on his property under our supervision in the future. A former blister rust worker is now employed by Mr. Mortimer, and it is planned for him to direct the work of other nursery employees on ribes eradication after our workers have checked the area and designated where ribes should be removed.

Table IV

Cost of Control Work In 1944

	Amount	Balance of Funds Available	Cost Per Acre		
			Ribes	Eradiation	Survey
Operating Agency	Expended Jan. 1 - Dec. 31, 1944	Jan. 1 - June 30, 1945	Initial Work	Rework	
Bureau (3103)	4,156.79	2,510.61	-	-	-
	(1)				
State	2,990.62	2,389.12	-	-	-
Total					
Cooperation	7,147.41	4,899.73	-	1.46	0.09
Forest Service:					
Pisgah	3,029.17	21.23	-	1.42	-
TOTAL					
ALL FUNDS	10,176.58	4,920.96	-	1.43	0.09

(1) Direct aid

RECOMMENDATIONS FOR FUTURE WORK

Work for 1945 in North Carolina is planned for private lands only. An inspection of northern Ashe County has revealed several stands of white pine with mostly reproduction, making good growth, and since that section contains numerous patches of native ribes, resurvey is planned for the spring of 1945.

Post checking and ribes eradication work is planned for the balance of Avery County in 1945 and after completion of Avery, work will be started in Watauga County.

Considering the work after the calendar year of 1945, plans must be less specific but the following points can be set forth:

1. For the duration of the war the work on all ownerships should be limited to post checking, and where necessary conduct ribes eradication of the present control area.
2. As much reconnaissance survey work as practical should be continued and in cases where it is found that white pine is reproducing in ribes-bearing lands, surveys should be made to determine the exact status of control. Sometime during the post war period a resurvey should be planned for the entire white pine producing areas of the State since outside of the actual grid survey most of our present data is but little more than an estimate. It is believed that if maps comparable to the present TVA maps become available, such a survey could be made at a relatively small cost and at the same time a recheck made for cultivated ribes bushes which were missed on previous workings or which may since have been planted. Regeneration from sprouts and seed is also likely to have occurred since the original working.

3. A coordinated educational program should be worked out in cooperation with the Extension Service, State Forest Service and various Federal Agencies for the purpose of encouraging the planting of white pine and forest management, as well as preventing the planting of white pine at the very highest elevations where ribes are frequently so abundant that the control of rust may not be feasible.
4. As previously noted in this report, we are not insisting upon the same standards in ribes eradication work as were necessary in areas where the disease is generally present. It is probable that in the future the rust will become well established in scattered and isolated white pine trees at the very highest elevations where, because of white pine values control was not practical. If such a condition should come about it may become necessary to conduct more rigid control measures. However, because of the ecological distribution of ribes and white pine it is not expected that a serious loss will occur in most of the better stands of white pine in the state.

WHITE PINE BLISTER RUST CONTROL WORK

IN THE

STATE OF VIRGINIA

1944

BLISTER RUST CONTROL AREA NO 1

Henry E. Yost - Area Leader

H. B. Teague - Assistant Area Leader

INTRODUCTION

Up to about 1929 no blister rust control work was carried on in Virginia except scouting for the disease and a small amount of other work such as nursery sanitation. From 1930 to 1933 some control work was performed on the George Washington National Forest. From 1933 to 1942 a large amount of work was carried on almost entirely through the CCC and other emergency programs. Since 1943 the work was continued on Federal lands, and was financed by the respective Federal Agencies. Work on privately owned lands was financed by the State of Virginia and the Bureau of Entomology and Plant Quarantine.

Practically all of the work up until the Fall of 1944 was under the direction of Mr. Roy G. Pierce as leader in charge of the Southern Appalachian Region, with headquarters in Washington until 1936 and then in Richmond, Virginia. Upon his retirement he was succeeded by Mr. J. Curtis Ball and the Regional Office was moved to Harrisonburg, Virginia. Prior to 1944 a state leader was in charge of each state, except Maryland and Delaware which were handled as one unit. During 1944 the region was divided into two areas as follows with an Area Leader and Assistant Area Leader in charge of each area

Area No. 1

Virginia

North Carolina

Maryland

Delaware

District of Columbia

Area No. 2

West Virginia

Kentucky

Tennessee

Georgia

South Carolina

This was made possible by the completion of a large part of the work in some states and the general curtailment of the work during the war.

A survey, and for the most part the necessary ribes eradication work, was performed in the state from about 1933 to 1939. This work covered only the best pine stands and it was found that white pine had extensively reproduced itself during this period. A resurvey by improved methods was begun in 1940. To date the resurvey has in many cases shown over double the amount of white pine originally reported. The resurvey was begun in 12 counties and the approximate status by ownership is shown on the next page.

Table I

Status of Resurvey in Percent by Counties
as of December 31, 1944

County	Approximate Percent of County Resurveyed	
	State & Private Lands	Federal Lands*
Alleghany	-	85
Amherst	-	20
Augusta	60	85
Botetourt	-	100
Giles	100	-
Highland	30	100
Page	25	90
Rockbridge	-	30
Rockingham	90	100
Shenandoah	30	-
Smyth	20	100
Washington	5	100

*The above does not take into account the Shenandoah National Park which is about 80% resurveyed.

**Of all the counties in the control area of the state only 35% have been resurveyed

The ribes eradication work found necessary on this resurvey has for the most part kept abreast of the resurvey on state and privately owned lands, as well as on Federal lands, except for the George Washington National Forest.

Table II

Status of Control Work in Virginia As of December 31, 1944

White Pine:	Control:	Control:	Control:	Total:	Total:	*Per Cent:	Acres
Acreage	Acreage	Acreage	Acreage	Ribes	Man	Initial	On
In Control:	In	Initially:	Re-	Destroyed:	Days	Work	Maintenance:
Area	State	Worked	worked			Completed:	
478,193	:1,102,617	:1,048,852	:68,567	:9,230,038	:92,769	:95	:860,859

Includes only that part of the total control area surveyed to date. In the above table the term "on maintenance" is used to designate control acreage which is naturally free of wild ribes or on which ribes have been reduced to a point where no rework will be required for about 5 to 10 years or more. The reworking of an area depends on the results obtained from post checks which are performed periodically.

spread of Blister Rust

No extensive spread of the rust has been noticed since the fall of 1941. However, a small amount of infection was found on wild ribes in Patrick County for the first time in 1944. This is also the first time wild ribes has been

reported in Patrick County. The status map on page 50 shows the counties in which infection on ribes and white pine have been found.

BLISTER RUST CONTROL WORK IN 1944

Work during the year was carried on in the following counties on state and privately owned lands: See Table IV.

Table III

Summary of Ribes Eradication Work in Virginia 1944

AGENCY	First Working			Re Work		
	Acre	Free	Destroyed	Acre	Free	Destroyed
	Worked	Days	Days	Worked	Days	Days
Bureau & State	23,908	2,270	28,259	372	2,195	24,807
(Private Lands)						288
Forest Service						
Geo. Wash.	30,520	5,621	138,876	1,694	3,780	123,499
Forest Service						1,030
Jefferson	22,337	310	84,634	232	1,151	144,653
						526
Sub-total						
Forest Service	52,857	5,931	223,510	1,926	4,931	268,152
Park Service						1,556
Shenandoah N.P.	-	180	8,543	73	772	16,046
						302
Park Service						
B.R. Parkway	-	180	1,957	134	-	-
						-
Sub-Total						
Park Service	-	360	10,500	207	772	16,046
						302
TOTAL				(1)		
ALL AGENCIES	76,765	8,561	262,269	2,505	7,898	309,005
						2,146

(1) Of the total acres reworked, 2,732 acres were second working and 5,166 acres worked three or more times. Besides the 7,898 ribes-bearing acreage reworked 115,649 acres were blocked out as ribes-free as a result of resurvey and post checks

Table IV.

Counties Worked in 1944 on State and Private Lands

County	Survey	Ribes Eradication
Alleghany	X *	
Augusta	X *	
Botetourt	X *	
Craig	X *	
Giles	X *	X
Rockingham	X *	X
Smyth	X *	
Washington	X *	

*Counties in which the work was in part covered by Forest Service projects where private lands were closely intermingled with Federal lands.

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WHITE PINE BLISTER RUST
CONTROL STATUS MAP

STATE VIRGINIA

STATUS AS OF DEC. 31 1944
MONTH DAY YEAR

LEGEND

CONTROL AREA BOUNDARY

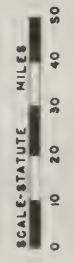
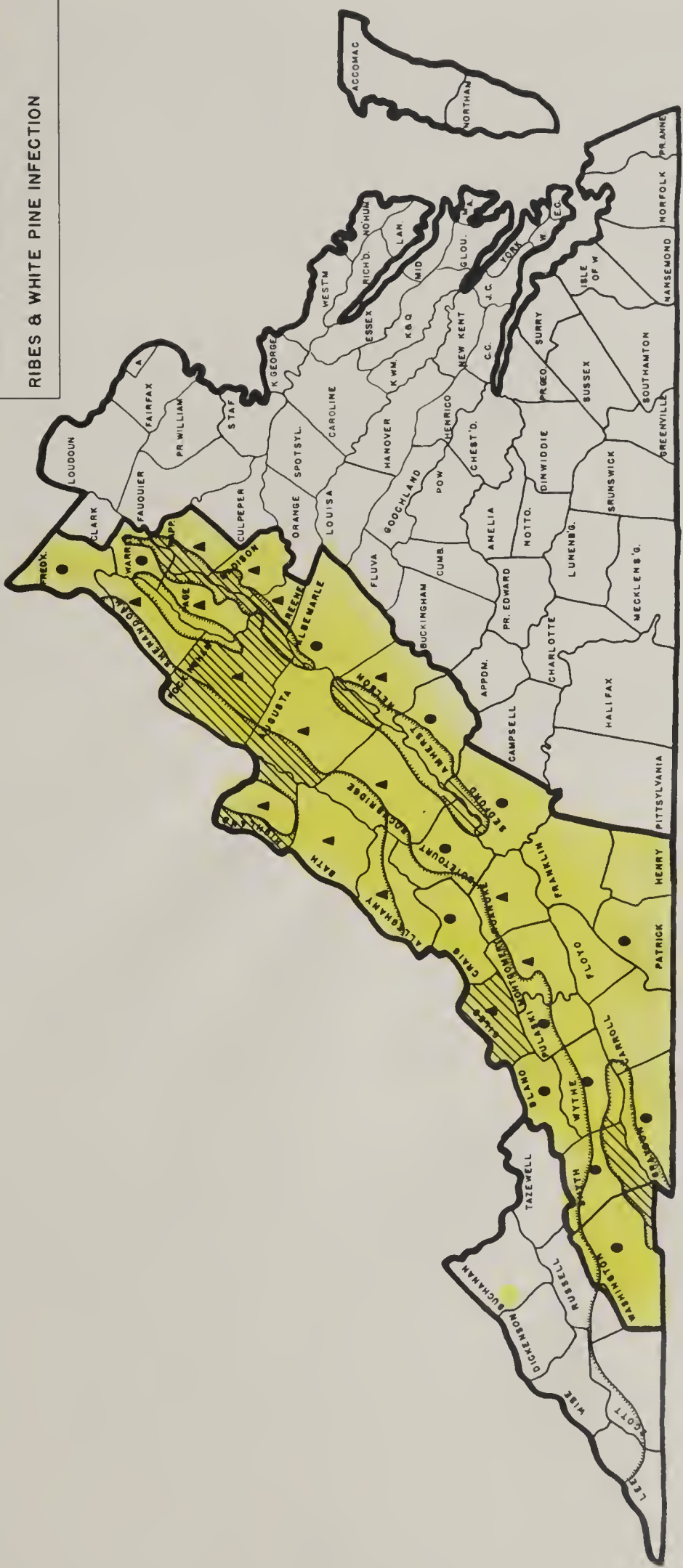
NATIONAL FOREST & PARK BOUNDARY

AREA INITIALLY WORKED

AREA REWORKED

RIBES INFECTION ONLY

RIBES & WHITE PINE INFECTION



In Alleghany, Craig and Botetourt Counties some data regarding the need for detailed survey was secured incidental to a reconnaissance survey of Forest Service holdings.

Insofar as practicable, state and privately owned white pine intermingled or adjacent to federal holdings were surveyed by Forest Service crews and the necessary adjustments made in the funds, thus eliminating the need for operating the training/other crews. It was necessary to employ crews exclusively on private lands in Giles and eastern Rockingham Counties. This, however, was not possible in the case of Park Service work since their labor was almost entirely Civilian Public Service enrollees. This close cooperation and the ease with which men can be transferred from one fund to another was found to be very advantageous to the work.

Most of the survey work was by what has been described in previous reports as the grid system. The Virginia State Planning Board has made available, maps 2" to 1 mile, showing roads, buildings, streams, forest overlay and other features. The use of these maps eliminates the need for much ground control survey and, except in extensive areas of sold woodland, saves about one-half of the former cost of the survey. One person, paid from State or Federal Blister Rust Control Funds, is assigned to aid in the preparation of these maps and works under the direction of Mr. Samuel O. Smart of the State Planning Board. Similar maps published by the TVA are available for that part of the State in the Tennessee River drainage. These maps are made possible by aerial photography, a subject in which appears to be in its infancy. According to some men, vast improvements in the accuracy and details of these maps, as well as their use, can be expected in the next 10 years.

The ribes eradication work was carried on by three-man crews where the bushes were generally light. In heavier concentrations a five-man crew was used. It is found that seldom are any tools required to dig wild ribes bushes. When extremely large bushes are found they can be cut off at, or just below ground level with a pair of hand pruners and the roots killed by the application of 1/4 to 1 pound of a mixture of equal parts of salt and borax. This not only saves much time but also prevents the germination of ribes seeds which is induced by disturbing the soil. About 100 pounds of this salt-borax mixture was used on the cooperative project during the year. No evidence has been found to date to indicate that this chemical is harmful to animal life, or when properly used, to nearby plants.

Immediately following, or as soon as practicable after each eradication job, a check is made to determine the effectiveness of the crews work. This is known as a "regular check." This is usually done by examining sample strips one rod wide at 5 chain intervals across the worked area. If it is found that the crew is leaving 25 feet or more of ribes live stem per acre a reworking is required as soon as practicable. Very little rework was found necessary this year. A similar check is made some 3 to 8 years after the area is worked to determine the need for a subsequent working. This is known as a post check. Due to the increase in pine, in most cases since the last working, an estimate of the pine is made at the same time and the entire operation is regarded as a resurvey.

WHITE PINE: DISTRIBUTION, PLANTING, PRODUCTION

The surveys to date indicate over 478,000 acres of land in Virginia on which white pine is an important component of the forest. Almost 60% of this is in state and private ownership and the resurvey is far from complete. When this is completed the total white pine acreage will probably approximate three-quarter million acres. The control area, i.e. the pine acreage with a protective zone of some 900 feet surrounding, is approximately 1,100,000 acres of which some 65% is in state and private ownership. About three-fourths of the control areas surveyed to date is found to be naturally ribes-free. A large part of the ribes-bearing acreage is near the limit of the ecological range of these bushes, which means that ribes regeneration following eradication will in many cases be light. This has proved true of many areas worked in the past.

Most of the white pine on this acreage is in the reproduction and immature classes, therefore, it will not be materially reduced by the present heavy lumbering operations. This cutting will, in many cases, tend to increase the pine acreage by soil disturbance and opening the forest canopy. It likewise will, in many cases, release much immature white pine formerly suppressed by hardwoods. This increase can be expected to be greater on privately owned lands since the most severe cutting is usually made on such lands.

The natural spread of white pine in hardwood stands is illustrated by the map on page 54 which shows the white pine acreage in 1938 and the results of the 1943 survey showing an increase of over 3 times the original acreage during the 5-year period. A large part of this reproduction is attributed to excellent forest fire control.

The planting of white pine during the last two years was practically discontinued because of labor shortage and greater efforts toward food production. No data is available for 1944. However, in 1943 through the efforts of the Soil Conservation Service over a quarter-million white pine trees were planted.

As a result of the wartime demands and increased industrial activity, the white pine cut in 1944 was over 2 times greater than in 1941, the figures being approximately 46,000,000 and 20,000,000 board feet respectively. the prices vary according to quality, accessibility and many other factors but it is estimated that an average of \$11.00 per thousand feet stumpage and \$35.00 per thousand F.O.B. mill is about right, which gives a value of about one-half million dollars on the stump, or over one and one-half million dollars when cut at the mill.

*1938 figures are from U. S. Census Bureau. The 1944 figures are an estimate based on reports of the Southern Appalachian Experiment Station and T.P.N.P. January - December, 1944.

PERSONNEL EMPLOYED

Personnel was one of the major problems during the year. At the peak of operations there were employed a total of 105 persons as follows:

<u>Agency</u>	<u>No. of Employees</u>	<u>Grade</u>	<u>Number</u>
Shenandoah National Park	12	Permanent Supervisors	3
Blue Ridge Parkway	8	Clerks	2
Gen. Washington National Forest	45	Temporary Supervisors	2
Jefferson National Forest	20	Straw Bosses	18
Cooperative	20	Laborers	80
TOTAL	105		105

During the year a total of 219 different individuals, including an estimated 30 CPS enrollees, were engaged in blister rust control work in Virginia. The high rate of turnover was due to a large extent to induction into the armed forces, going into defense work, employment of operators of small farms for part-time work and many other factors. Due to the relatively low wage rate and small monthly earnings it was difficult to secure the best type of worker in most cases. While this work was not subject to all the regulations of the War Manpower Commission, every effort was made to cooperate in this field. A strict policy was set forth whereby every man was encouraged to take off as much time as necessary to do part-time agricultural work or to resign to accept full-time farm or defense work. County Agriculture Agents were informed of this in each county where blister rust control work was carried on. In most communities it is not difficult to find men for ribes eradication work, however, finding men with sufficient education and intelligence to learn mapping or to assume responsibility is a problem.

A position as supervisor of the cooperative work was vacant throughout the year because no qualified applicant could be found. This work was, therefore, handled in conjunction with the Forest Service programs and divided between Assistant Area Leader Teague at Wytheville and Field Supervisor G. C. Cramer at Mount Solon.

No record was maintained but it is estimated that at least 25 persons entered the armed forces.

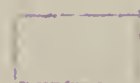
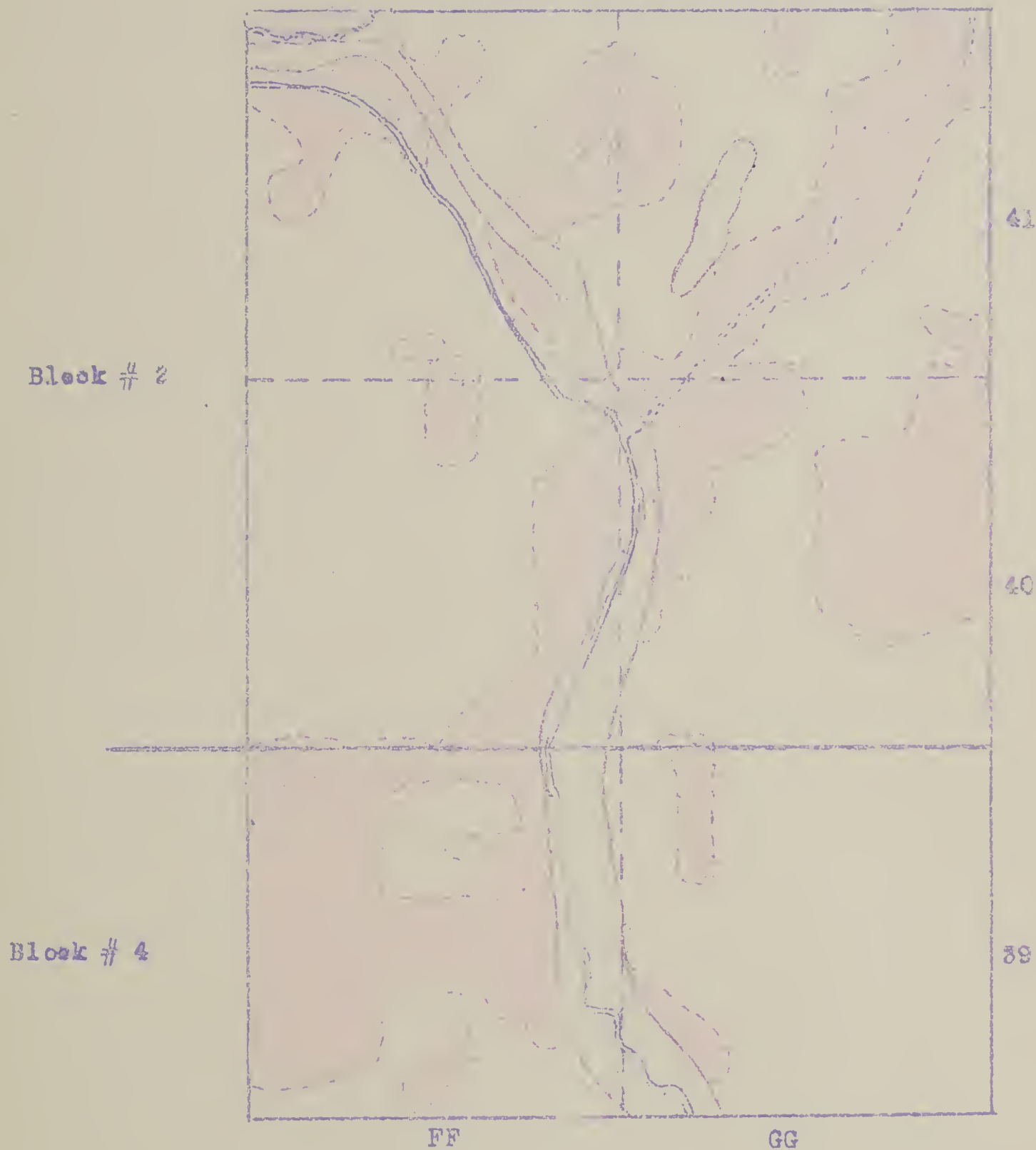
Due to the shortage of supervisory men it was impossible to carry on any field studies, as such, during the year in Virginia. Some comparable developments were made from a matter of necessity. The most outstanding of these were the improvements in mapping procedure previously discussed. The demand for cotton in the war effort made it impossible for us to buy wire for marking ribes eradication strips. In some cases scrap paper was used and red and yellow cloth flags proved satisfactory under certain conditions. The increased use of salt and borax resulted in some improvements in methods of mixing and packing. A large quantity was purchased and mixed in a concrete

MAP SHOWING INCREASE IN WHITE PINE ACREAGE
INDICATED BY RESURVEY IN 1943. ORIGINAL
SURVEY PERFORMED IN 1938.

MAP IS SECTION OF BLOCKS 2 AND 4, AUGUSTA
COUNTY, VIRGINIA.

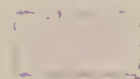
1844

(Scale:- 2 Inches equals 1 Mile)



Surveyed In 1938; Resurveyed In 1943

Acres White Pine----- 272



Increase in White Pine Acreage on Resurvey
in 1943:----- Acres White Pine-----1028

Total Acres of White Pine-----1297

mixer. A dispenser was made which reduces the time required to pack $\frac{1}{4}$ lb. bags of the chemical for use in the field.

Observations are being continued on pine infection plots and some of the ribes regeneration studies described in previous reports.

NURSERY SANITATION

No nursery sanitation work was carried on because it is not believed urgent at this time, and the curtailment of travel practically made this impossible. It is hoped that a re-examination of the important white pine producing nurseries can be made in 1945 or 1946. The blister rust control quarantine was enforced in the same manner as in previous years.

Table V

Cost of Control Work in 1944

Operating Agency	Amount Expended	Jan. 1 - Dec. 31, 1944	Balance of Funds Available	Jan. 1 - June 30, 1945	Cost Per Acre		
					Ribes Eradication	Initial Work	Survey
Bureau (3103)	4,243.89		3,329.43		-	-	-
State Dept. of Agriculture	4,520.28 *		3,076.35		-	-	-
Total							
Cooperation	8,764.17		6,405.78		1.10	0.88	0.06
Forest Service							
Geor. Wash.	24,377.72		10,754.38		1.66	1.51	0.11
Forest Service							
Jefferson	9,567.95		6,215.63		4.10	2.50	0.10
Total							
Forest Service	33,945.67		16,970.01		1.79	1.74	0.11
Park Service							
Shen. Nat. Park	2,839.60		1,000.00 **		1.69	1.63	0.31
Park Service							
B. R. Parkway	840.12		500.00 **		3.09	-	0.12
Total							
Park Service	3,679.72		1,500.00 **		2.39	1.63	0.22
TOTAL							
ALL FUNDS	63,230.06		24,875.79		1.61	1.50	0.09

*Includes \$708.00 indirect aid from the State of Virginia

**Estimated - cash and CPA

The above table shows total expenditures and costs per acre. The ribes eradication costs are based on the acres actually covered by crews instead of including ribes free areas surveyed.

The tendency was for costs to rise due to the increase in wages, salaries and supplies. Likewise the high turnover in personnel and the quality of men

obtainable tended to increase costs per acre. This was offset to some extent by time-saving short cuts developed during the year, as well as a reduction in travel and purchasing fewer supplies. The total expenditures were the highest for any year since the beginning of the blister rust control work in the state except 1940. The acres surveyed were about one-third more than any previous year and the acres covered on ribes eradication (ribes-free and ribes-bearing) was the largest since 1940.

CANKER ELIMINATION

No canker elimination work was carried on in Virginia this year. A study was made of previous work of this type with the conclusion that, except in certain very limited condition, the results do not justify the cost. This is ordinarily considered a salvage operation, however, in rare cases may be an aid in control work. Canker elimination in native stands is probably justified in protecting final crop trees, and more thought will be given to this in the future.

RECOMMENDATIONS FOR FUTURE WORK

The constantly changing manpower situation, together with various regulatory changes makes the preparation of work plans extremely difficult. However, it is hoped to do the following during the year 1945.

State Cooperative Project - Complete the white pine resurvey and necessary ribes eradication in Rockingham, Washington, and Smyth Counties. Begin resurvey in Wythe County and possibly Augusta County.

George Washington National Forest - Complete resurvey in Rockingham and possibly Shenandoah, Frederick and Page Counties. Begin survey in Bath and possibly Rockbridge County; do such ribes eradication as appears to be most urgent.

Jefferson National Forest - Complete resurvey in Smyth, Wythe, Grayson and Carroll Counties; begin survey in Pulaski and possibly Bland Counties; do the ribes eradication found necessary as a result of the survey.

Shenandoah National Park - Complete resurvey and do such ribes eradication as found necessary.

Blue Ridge Parkway - Do a recheck on cultivated ribes eradication south of Roanoke and check the areas worked in 1943 in Rockbridge, Nelson and Amherst Counties.

The following may be outlined as long-range plans for work on state and private lands:

1. Continue the annual appropriation of \$5,000.00 by the State which, when added to the Federal Allotment, will provide a working fund of some \$10,000.00 per year.

2. Complete the resurvey as soon as possible, which at the present rate may be completed in three or four years.

3. Insofar as practicable, do the necessary ribes eradication as the survey is made.

4. Cooperate with other State and Federal Agencies in encouraging the production of white pine through planting and timber management on ribes-free lands.

5. Continue the quarantine against blister rust as in the past.

WHITE PINE BLISTER RUST CONTROL

IN THE

STATE OF GEORGIA

1944

BLISTER RUST CONTROL AREA NO. 2

Ralph W. Welch - Area Leader

W. V. Zimmer - Assistant Area Leader

INTRODUCTION

This report covers progress made for the full calendar year of 1944, as well as giving a general summary of the work since the beginning of the project to December 31, 1944.

In spite of some labor shortages, effective work has been performed using high school age boys and older men. Our labor policy does not take men from necessary activities such as farming, essential production plants, etc. There has been no competition with the farmers or war plant activities because in general neither of these classes of activities were much in evidence in the forested areas worked by our crews.

Camps continued to be found the best method of handling crew work from the standpoint of saving of tires, gasoline and excessive man hours utilized in transportation to isolated sections of work. During the first seven months of the year camp was maintained on the head of Rock Creek in Fannin County. After covering this area, camp was moved to Union County and located in the recreational area known as Lake Winfield Scott and operations were continuing from this location at the close of the year.

ORGANIZATIONAL CHANGES

In 1944 a reorganization plan was formulated and put into force, which changed our organization in various ways. The regional office was moved in September from Richmond, Virginia to Harrisonburg, Virginia, a more centralized point. During the year, Mr. Roy G. Pierce retired after many years in blister rust control work. Mr. J. Curtis Ball succeeded Mr. Pierce and Mr. John R. George is administrative assistant in our regional office.

The region has been divided into two areas with Georgia, South Carolina, Tennessee, Kentucky and West Virginia comprising Area No. 2. Mr. Ralph W. Welch is Area Leader with headquarters at Marlinton, West Virginia and Mr. W. V. Zimmer is Assistant Area Leader with headquarters at Dahlenega, Georgia. Mr. Fred W. Hall continued as Field Supervisor in Georgia and Miss Virginia Ash has been succeeded by Miss Margaret L. Simmons as clerk in the Dahlenega office.

Table I

Status of Control Work as of December 31, 1944

White Pine:	Control:	Control:	Control:	:	:	Per Cent:	Acres	:
Acreage In:	Acreage:	Acreage:	Acreage:	Total	Total:	Initial	On	:
Control	In	Initially:	Re-	Ribes	Man	Work	Mainten-	:
Area	State	Worked	worked	Destroyed:	Days	Completed:	ance	:
:	:	(1)	:	:	:	:	:	:
587,587	892,065	544,055	9,068	3,558,962	20,884	60.9	531,273	:

(1) Of this acreage 539,969 acres have been grid mapped. Only net figures used in above table for initial acres worked, reworked acres, ribes pulled and

man-days. Because of adjustments made in the control area a number of ribes originally pulled and man-days expended have been dropped.

In general the bulk of the white pine growing lands in north Georgia are free of wild ribes. This condition is mainly due to the fact that ribes in this section generally grow at a much higher elevation than does white pine. Thus out of the 544,055 acres initially worked to date only 12,780 acres are in ribes-bearing territory. The remainder, 531,273 acres, is therefore on maintenance which is 97.6 percent of the total net acres worked to date.

As of December 31, 1944, we have revised our estimated figures for control acreage in the state which now stands at 892,065. Of this figure 539,969 acres of control area have been mapped and 531,213 acres placed on maintenance. Our revised estimate figure for white pine in the state is 587,587 acres of which 428,457 acres have been mapped and of which 271,681 acres average 50 stems or over per acre, and 156,776 acres average 50 stems or less per acre. Giving a further breakdown of this acreage, 143,856 acres of Federal land average 50 stems or better per acre and 127,825 acres of private land average 50 stems or better per acre; 66,317 acres under federal ownership and 90,459 acres privately owned have less than 50 stems per acre. The ribes-bearing acreage within the control zone has been cut to less than 13,000 acres.

Recent grid surveys indicated a general increase in white pine stocking at higher elevations and it is therefore probable that the ribes and white pine association may become more evident in the future, necessitating additional control work.

Originally more wild ribes were found in the north central part of the state, namely Towns and Union County near the crest of the Blue Ridge Mountains, than in any other section of the control area. The grid survey during the next year or so should give us a good picture of the status of white pine and ribes eradication in the Blue Ridge section. Should this section prove to be similar to other sections of Georgia, the survey will reveal that the larger part of this ribes-bearing acreage can be eliminated and disregarded as it will be found to be outside of our necessary protective zone. Even so, it is expected that these two counties will increase the ribes-bearing acreage by a considerable figure.

SUMMARY OF BLISTER RUST CONTROL WORK IN 1944

During the year, the grid survey of white pine areas continued in the state, and good progress was made towards completion of the western half of the north Georgia white pine belt. A total of 73,600 acres of control area was surveyed, of which 43,660 was Federally owned (Chattahoochee National Forest) and 29,940 privately owned. Within the control acreage 68,374 acres of white pine were mapped, 41,391 being Federally owned and 26,983 being under private ownership. The white pine acreage mapped included 30,161 acres with 50 or more stems per acre and 38,213 with less than 50 stems per acre. Only 116 acres of ribes-bearing land was found on Federal land and more on private and state lands. This enabled us to place 73,484 acres on maintenance which indicates that ribes growth is absent or of small consequence and that the acreage will require no additional work for many years and then only periodical checks to ascertain if ribes are coming in or to gather information as to the changes taking place in growth, cutovers

WHITE PINE BLISTER RUST
 CONTROL STATUS MAP

LEGEND

CONTROL AREA BOUNDARY

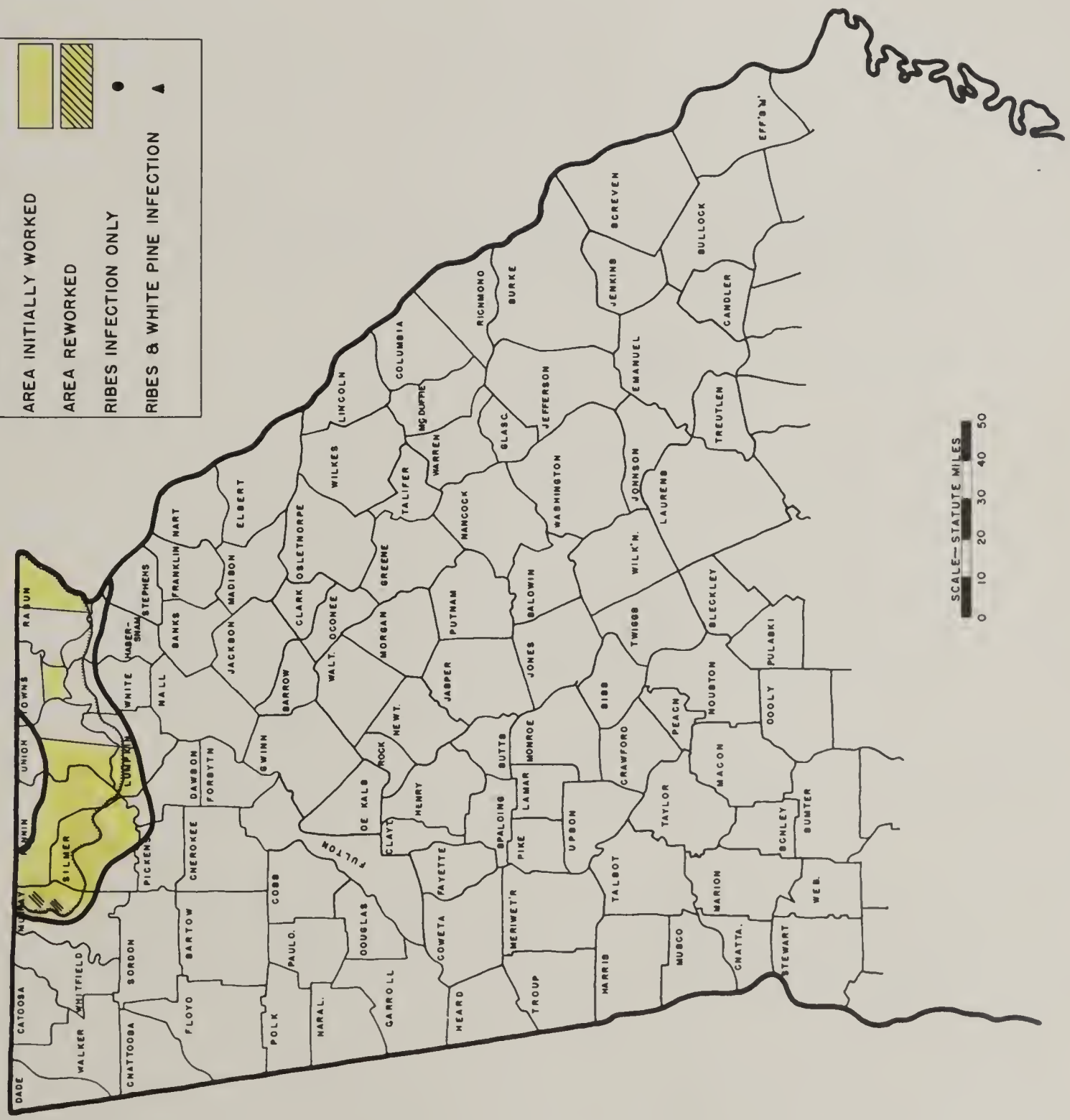
NATIONAL FOREST BOUNDARY

AREA INITIALLY WORKED

AREA REWORKED

RIBES INFECTION ONLY

RIBES & WHITE PINE INFECTION



SCALE—STATUTE MILES
 0 10 20 30 40 50

and reproduction of white pine. The 116 acres which were found to be ribes-bearing were worked by eradication crews and 6,910 ribes were destroyed using 237 man-days of labor for the job. Chemicals were used on crowns and roots where necessary to prevent sprouting.

Post checks revealed that it was necessary to rework Fort Mountain State Park area in Murray County, where ribes reproduction since 1938 and 1939 made a second and some third working advisable. Four hundred acres were worked by eradication crews and 32,418 ribes were destroyed. The time required for this project was 542 man-days. The Fort Mountain Park project was not completed as work was discontinued when State and Cooperative funds became exhausted for the present. It is planned to resume this reeradication job in the coming summer when more funds will have been made available for the work.

Table II

Summary of Ribes Eradication In Georgia 1944

Operating Agency	(1)			
	Acres Worked	First Working	Other Working	
	Ribes-Acres	Ribes	Man	Ribes-Man
	Free	Destroyed	Days	Destroyed:Days
Bureau & State	:	:	:	:
(State and	:	:	:	:
Private Lands)	-	-	-	400
Forest Service	:	:	:	:
(Chattahoochee	:	:	(2)	:
National Forest)	73,484	116	6,910	1,149
	:	:	(2)	:
TOTAL	73,484	116	6,910	1,149

(1) Includes second and third workings (135 acres second-265 acres third

(2) Man-days include 237 on ribes eradication and 912 on examining and blocking out ribes-free acreage. Of the 73,484 acres blocked out 43,544 was Forest Service land and 29,940 acres of private lands intermingled with Federal holdings.

One phase or another of the control program has been conducted in the following counties during the year: Murray, Gilmer, Dawson, Fannin, Union, White and Lumpkin.

An eight to ten man crew was engaged in reeradication on State land in Murray County, Fort Mountain State Park and 400 acres of ribes-bearing land was covered from which 32,418 wild ribes were destroyed, utilizing 542 man-days. A chemical mixture consisting of salt and borax was used where necessary on roots and crowns deeply embedded in rocky places to prevent future sprouting.

It was determined through our survey within the Chattahoochee National Forest that only four grids, located in Union County in the vicinity of Wolf Pen Gap, were ribes-bearing. The survey also revealed that out of the 2,500 acres contained in these four grids that it would only be necessary to actually perform eradication over 116 acres in order to give adequate protection to

the pine in the area. A crew consisting of eight men worked this 116 acres and 61,910 ribes were removed, using 237 man-days. Chemicals were also used where necessary on this job. The work was done rather late in the fall, and although a regular check behind the crew showed a very good eradication job, it is planned to check this area again in the early spring of 1945.

Records

Permanent control records have been brought up to date and such corrections or revisions have been made as were necessary to complete the records. New estimate figures have been made and plans laid for continuation of the work in a systematic manner, the ultimate objective being to place the entire state on a maintenance basis at the earliest possible date. Control post war plans have also been completed and work laid out for operation under the plan.

Quarantine Regulations

A tentative revision of quarantine laws restricting the shipment of ribes into pine areas has been completed and submitted. Should this plan be adopted, it will restrict only those post offices within pine growing areas and not entire counties as a whole, as has been the case previous to this revision. If approved these new regulations will become effective sometime in 1945.

Labor

Securing labor has not been a major problem in our section. Further information on this subject will be found later in this report. Transportation, although quite a problem, has been worked out in the best manner possible under the circumstances. As a whole, it is felt that the operation of the project under war conditions has been creditable and good results have been obtained. The full cooperation of all persons employed on this project and the cooperation of the personnel of our cooperative agencies has done much to make it a successful year.

A total of 47,680 acres were covered by general reconnaissance. This acreage contained no pine, or such a small amount of scattered pine that the value did not warrant expenditure of funds for detailed survey or grid mapping.

COOPERATION

Agencies cooperating in control work were the Georgia State Department of Entomology, Bureau of Entomology and Plant Quarantine, and U.S. Forest Service. Funds for conducting the work were provided by each of these agencies and without the whole hearted support of our several cooperators it would not have been possible to bring the year's work to a successful close. The work was performed on Federal land from a camp located on Rock Creek in Fannin County and later from a camp located in Union County at Lake Winfield Scott. The Fort Mountain Station Park project was effected with local labor recruited in the near Ellijay, Georgia.

WHITE PINE

Out of a revised estimate of 892,065 control acreage (white pine plus protective zone) 539,969 acres have been mapped with 428,457 acres white pine. Most of this white pine is young growth with 75 percent or more being four inches or less in diameter. The distribution is quite wide with stockings varying from less than 50 stems per acre to well over a thousand per acre. Under fire protection white pine does exceptionally well in north Georgia, and thrifty reproduction is rapidly spreading in many sections, increasing the acreage greatly. To date, blister rust infection has not been found in the state on either the ribes or white pine host.

The cutting of white pine and saw mill activities as a whole have been accelerated this year on both Federal and privately owned lands. The U.S. Forest Service records show that 351,040 board feet of white pine were cut from Federal lands of the Chattahoochee National Forest during the year of 1944. These figures were obtained through the cooperation of the Forest Supervisor. It is not possible to give definite figures as to board feet cut from private lands but from the writer's opinion and observation, the figures in board feet from private lands would double or triple those of Federal lands. No new white pine plantations have been established during the year. White pine is noticeably replacing and reseeding cutover hardwood stands and dead chestnut areas, in some cases running from 1,500 to 2,000 stems per acre.

PERSONNEL EMPLOYED

For the year as a whole our crew has consisted of six to ten men. Our peak was reached in the summer. At that time two crews were being operated, a survey crew on Forest Service funds and a reeducation crew on Regular funds with a total of 20 men employed.

No serious labor shortage has been noticed during the year, although we have had a large turnover in comparison with the small number of men employed. Quite a few have gone to various branches of the Armed Forces. Some high school students were used during the summer months and returned to school in the fall. Several employees worked on a seasonal or part time basis, returning to the farms during the planting and harvesting seasons. Generally speaking, the operation of camps has proved satisfactory in Georgia, although some prospective employees want to return to their homes each night and will not consider employment which keeps them away. However, our project must be operated from camps from the standpoint of staying within our mileage allotment and conserving means of transportation.

Field supervision was continued under the direction of Fred W. Hall, assisted by Andrew J. Davis, Jr. Miss Virginia Ash who was employed in the Dalton office resigned, effective September 1, after one and a half years with our organization. Miss Margaret L. Simmons has replaced Miss Ash.

FIELD STUDIES

The survey crews are running less strips per grid on poor or scattered pine acreage and on unlikely ribes areas at low elevations. This, of course, reduces the man-hours in completing a grid, but in using this method it is very essential that the men are well instructed and checked, from the standpoint of off-setting from their lines and examining all old abandoned fields or house sites as well as rocky coves for the presence of ribes.

Until this year three study plots have been maintained in the state for the purpose of increasing our knowledge concerning ribes ecology. All but one, however, have now been abandoned. The plot retained is located in Murray County in Fort Mountain State Park. During the year this plot (*curvatum*) was checked, information assembled, and new corner posts and stakes set, putting it in good condition for checking and future collection of data. The results of this study revealed that *Ribes Curvatum* (granite gooseberry) regenerates very heavily from seed but mortality is very high which probably accounts for its limited distribution. Regional technical memorandum No. 11 summarizes data taken on this plot for the last three years.

It is planned to put in one or two additional study plots in Union and Towns Counties during the coming year.

Table III

Cost of Control Work In 1944

Operating Agency	Amount	Balance	Cost Per Acre		
	Expended	of Funds	<u>Ribes Eradication:</u>		
	Jan. 1 -	Jan. 1 -	Initial:	Rework	Survey
	Dec. 31, 1944:	June 30, 1945:	Work		
Bureau of					
Ent. & Plt.					
Quar. (3103)	2,377.58	281.76	-	-	-
State -					
Dept. of					
Entomology	1,356.56	744.14	-	-	-
Total -			(1)		
Cooperative	3,734.14	1,025.90	-	6.91	-
Forest					
Service			(1)		(1)
Chattahoochee	10,129.11	5,389.28	15.28	-	0.09
TOTAL					
ALL FUNDS	13,863.25	6,415.18	(2)	(2)	(2)

(1) Cost per acre based on overall cost of project. Cost of eradication was high mainly because of extremely rough country worked.

(2) Cost per acre based on total acres worked (ribes-free and ribes-bearing) was 19¢ per acre.

RECOMMENDATIONS FOR FUTURE WORK

Plans call for completion at the earliest possible date of the survey by grid system where pine warrants, or ribes are likely to occur, to spot map scattered pine by grids on location maps. To definitely locate all old ribes eradication areas on grid maps by grids and blocks. To check all old ribes eradication areas and to throw out such areas or parts of such that are too distant from pine, thus cutting our ribes-bearing acreage as much as possible, and still maintain adequate protection.

To effect this program, an eight to ten man crew trained in both ribes eradication and survey will be used, operating from camp sites located as near the areas to be worked as possible. Arrangements have already been made for a camp location at Unicoi Gap for at least the first six months of the coming year and probably longer. Length of occupation will be determined by how much ribes eradication work is turned up by survey.

A small crew will be used to complete the reeradication project on Fort Mountain State Park in Murray County, and it is hoped that this work can be finished with funds that will be available in the coming fiscal year.

The exact time at which the work can be placed on maintenance will depend upon several factors; the size of crew that is employed, which of course is directly determined by the amount of funds allotted, and the amount of ribes-bearing land found within the control zones as will be determined by survey in Union, Towns, White and Habersham Counties.

Several years have elapsed since any checks have been made on cultivated ribes and it is suggested that this be done before the state is placed on a complete maintenance basis.

WHITE PINE BLISTER RUST CONTROL,

In The

STATE OF TENNESSEE

1944

BLISTER RUST CONTROL AREA NO. 2

Ralph W. Welch - Area Leader

W. V. Zimmer - Assistant Area Leader

INTRODUCTION

Blister rust control work was begun in Tennessee in 1933 under the CCC program and by the end of 1944 the work neared completion in the State. Virtually all of the white pine areas within Tennessee have been mapped and classified, and the ribes areas within infecting range have been worked once, many of them twice. Several areas upon which ribes were destroyed in earlier years were later found to be too far removed from white pine stands of commercial value, and no further work will be necessary on such areas unless, in the future white pine reproduction spreads to the high mountain elevations where the majority of the highest concentrations of ribes are found.

Due to completion of the greater part of the program in Tennessee, the State has now been incorporated into a larger working unit comprised of Tennessee, Georgia, South Carolina, Kentucky and West Virginia, known as Blister Rust Area Number 2. Much of the control area throughout this five state area, especially in the first four states listed, has been placed on a maintenance basis and will require a minimum of control work in future years. Therefore, it was no longer necessary to maintain a separate office for conducting the program in each state, and the Tennessee office at Knoxville was discontinued for that reason. Prior to the organization of Area No. 2 Mr. R. D. Tanksley was in charge of control operations in the state. Under Mr. Tanksleys supervision blister rust control work progressed very satisfactorily and due credit is given him in bringing about the adequate control of blister rust in Tennessee.

Table I

Status of Control Work in Tennessee As of December 31, 1944

White Pine:	Control	: Control	: Control:	Total	: Total:	Per Cent:	Acres	:
Acreage In:	Acreage	: Acreage	: Acreage:	Ribes	: Man	: Initial	: On	:
: Control	: In	: Initially:	Re-	: Destroyed:	Days	: Work	: Mainte-	:
: Area	: State	: Worked	: Worked	:	:	: Completed:	nance	:
:	:	: (1)	:	: (2)	:	:	: (3)	:
: 760,149	: 1,635,757	: 1,631,257	: 14,718	: 6,012,591	: 37,908	: 99.7	: 1,598,939	:

(1) Includes 1,074,477 acres private land, 484,572 acres Forest Service land and 76,708 acres Park Service land.

(2) First working - 5,251,497 wild 265,029 cultivated bushes, second working - 396,065 wild bushes.

(3) Acreage needing but little attention within the next ten year period.

SUMMARY OF BLISTER RUST CONTROL WORK IN 1944

During the year a control program was conducted in two Tennessee counties within the Cherokee National Forest (Monroe and Unicoi counties) and in two counties within which the areas worked were all privately owned (Morgan and Cumberland Counties)

CONTROL STATUS MAP



In Monroe County, the survey program was completed on Forest Service land and a total of 142,052 acres of control area was mapped, all of which was free of ribes except 230 acres on Sycamore Creek, a tributary of the Tellico River. Ribes eradication was conducted within this one area, and 12,400 ribes were destroyed. All of the Monroe County work was first working.

The work in Unicoi County was confined to post checking of old ribes areas and the second working of those areas, were needed. A total of 4,901 acres were post checked, but only 805 acres needed ribes eradication, and only 8,180 ribes were destroyed on this acreage, all of which was second working on Forest Service land.

In the Cumberland Mountain white pine belt of the State, work was performed in Morgan and Cumberland Counties, all under private ownership. First working had been completed in these two counties a number of years ago, and the program for the current year was all classed as second working.

In Morgan County, 5,047 acres of control area were post checked and a reworking was found necessary over 1,145 acres. When ribes eradication had been completed over this acreage, 15,722 ribes had been destroyed with an expenditure of 358 man-days labor. No additional work will be needed within this county for the next five years.

Post checks were conducted over 132 acres of control area in Cumberland County and ribes were found over the entire acreage. The eradication crews destroyed 3,469 ribes, covering 87 acres on second working. The program was not begun until late in the season, and therefore all necessary work was not completed, but work will be resumed in 1945.

Recapitulated below appears a summary of the various phases of the 1944 control program:

(1) A total of 44,980 acres of white pine and 142,052 acres of control area were surveyed and mapped for the first time in 1944 within the Cherokee National Forest, utilizing 842 man-days labor.

(2) Within the Forest, 4,901 acres were post checked, using 176 man-days labor; and on private land 5,177 acres of control area were post checked using 229 man-days.

On Forest Service land, 1,035 acres of ribes-bearing land were worked and 20,744 ribes were destroyed thereon by utilizing 96 man-days labor; and on private land 1,232 acres ribes-bearing were worked, 19,191 ribes destroyed, and 431 man-days used.

The following table indicates the scope of the work by agencies and workings.

Table II

Summary of Ribes Eradication in Tennessee 1944

Agency	: Acres :		First Working			Second Working		
	: Worked :		: Acres :	: Ribes :	: Man-:	: Acres :	: Ribes :	: Man-:
	: Free :		: Destroyed:	: Days:		: Destroyed:	: Days	
Bureau & State	:	:	:	:	:	:	:	:
(Private Lands)	: - :	: - :	: - :	: - :	: - :	: 1,232 :	: 19,191 :	: 431 :
Forest Service	:	:	:	:	:	:	:	:
Cherokee	:	:	:	:	:	:	:	:
Nat'l. Forest	: 141,822 :	: 230 :	: 12,564 :	: 64 :	: 805 :	: 8,180 :	: 32 :	:
TOTALS	: 141,822 :	: 230 :	: 12,564 :	: 64 :	: 2,037 :	: 27,371 :	: 463 :	:

COOPERATION

The 1944 control program was effected through appropriations made by the U. S. Forest Service, Bureau of Entomology and Plant Quarantine and the Tennessee Department of Conservation. The Forest Service allotted sufficient funds to complete all work necessary at the present time in the Cherokee National Forest. The Bureau of Entomology and Plant Quarantine provided funds which were used to match the \$2,000.00 appropriation made available by the Division of Forestry, Tennessee Department of Conservation, under the direction of Mr. J. O. Hazard, Nashville. Also Mr. G. M. Bentley, State Entomologist and Plant Pathologist, cooperated in effecting the program.

Forest Service officials of the Cherokee National Forest assisted materially by making available a number of trailers and other materials used in establishing and maintaining a small camp on the Tellico River, Monroe County during the first half of the calendar year. Conducting the work from the camp permitted substantial savings in mileage as well as travel funds.

The Tennessee Valley Authority gave the fullest cooperation to the blister rust control program in all years of their tenure as a government agency, and the use of TVA maps has been a leading factor contributing towards the success of our program in the State of Tennessee. The U. S. Post Office at Knoxville deserves credit for cooperation, since that agency has furnished office space for blister rust administrative officials since the beginning of the work. Also, during the current year, county court officials at Wartburg, Morgan County, made office space available in the County Court House for our district agent.

WHITE PINE: PRODUCTION, VALUES, REPRODUCTION AND ASSOCIATION WITH RIBES

In Tennessee, the production of white pine lumber and lumber products has been accelerated in recent years due to the increased demands in war-

times. According to the best available estimates, the amount of white pine lumber produced within the state in 1942, 1943 and 1944 has been approximately 42,000,000 board feet, with a stumpage value of roughly \$375,000.00. During this three year period of production, Tennessee ranked third among the states within the Southern Appalachian Hardwood Region.

White pine reproduces itself well in the lower altitudes of the Appalachian and Cumberland Mountains in the state, and if given adequate protection from fire, cut-over areas will produce dense stands of young white pine.

At the higher altitudinal range of white pine, ribes growth is occasionally quite concentrated. However, as is the case in most sections of the Southern Appalachians south of the two Virginias, ribes species make an optimum growth in an elevation range bracket which is slightly higher than the range of native white pine. From the standpoint of blister rust control, this is a fortunate circumstance. Under these conditions, our chief control problem is found in those sections where the growing habitats of the two species overlap.

Such an association of the two species is more frequently found in local sections of the Cumberland Mountains, although the two hosts are also associated in localities of the Appalachian Mountains in the extreme northeast corner of the state. In the latter section, ribes bushes infected with blister rust were found in 1941, in Johnson and Carter Counties near the North Carolina line. No new infections have been found since.

PERSONNEL

The majority of the work accomplished in the Cherokee National Forest was conducted from a small trailer camp established on the Tellico River in Monroe County. After completion of the work in that county in mid summer, the camp was discontinued. Control work continued until fall in Unicoi County, but it was not necessary to establish another camp since local labor was convenient and adequate to satisfy our needs for the small project in Unicoi County. At the peak of the season, 10 employees were engaged in control work on National Forest holdings.

The project which operated on private holdings in Morgan and Cumberland Counties was opened in April and closed at the end of October. Local labor was adequate in this section of the state and a camp establishment was not necessary. A maximum of 16 employees was engaged in the control program, but the average for the entire season was far less.

Table III

COST OF CONTROL WORK - 1944

	Amount	Balance	Cost Per Acre		
			Ribes Eradication:		
OPERATING	Expended	of Funds	Initial	Rework	Survey
AGENCY	Jan. 1 -	Jan. 1 -	Work		
	Dec. 31, 1944:	June 30, 1945:			
Bureau					
Ent. & Plt.					
Quar. (3103)	1,952.33	564.12	-	-	-
State Dept.					
of	(1)	(1)			
Conservation	1,511.92	1,238.58	-	-	-
Total					
Cooperative	3,464.25	1,802.70	-	1.45	-
Forest					
Service					
Cherokee N.F.	5,859.01	1,333.31	1.21	0.17	0.03
TOTAL					
ALL FUNDS	9,323.26	3,136.01	1.21	0.95	0.03

(1) Cash only, exclusive of contributed services.

RECOMMENDATIONS FOR FUTURE WORK

In 1945, plans have been formulated to continue the second working program in Cumberland County which was begun in 1944. The operation will begin in April and continue until completed, using a small crew for eradication and a two man unit for post checking purposes.

As previously indicated, the vast majority of Tennessee's control acreage is now on a maintenance basis, requiring a minimum of control activities in the near future. The entire white pine acreage within the state, except approximately 1,500 acres in Roane County, has been examined, mapped, and given initial protection from blister rust. A considerable portion of the ribes-bearing acreage in the control area has been reworked once. Other ribes areas have been eliminated after the first working, since the growth of near by stands of white pine was considered of insufficient value to merit additional control measures.

Blister rust control activities will not be completely suspended within the State during the next five year period, but expenditures for "holding the line" will be considerably less than in the past.

WHITE PINE BLISTER RUST CONTROL

IN THE

STATE OF WEST VIRGINIA

1944

BLISTER RUST CONTROL AREA NO. 2

Ralph W. Welch - Area Leader

W. V. Zimmer - Assistant Area Leader

INTRODUCTION

In mid year, a reorganized plan for administering blister rust control work became effective and a new geographical unit was established in the Southern Appalachian Region. Heretofore, blister rust control units had been maintained within the various states of the region, each state unit being headed by a leader. Under the reorganized plan a number of states were consolidated into one working unit headed by a single leader and his assistant.

The new area included West Virginia, Georgia, Tennessee, South Carolina and Kentucky, or roughly the area lying on the west slope of the Southern Appalachian Mountains. Area Number 1 had been previously established on the east slope of the mountains in a similar fashion, therefore the new unit was organized as Area Number 2. Also, as a part of the plan of reorganization, headquarters for the entire region was moved from Richmond, Virginia to Harrisonburg, Virginia, the latter location being more centralized for administrative efficiency. Mr. R. G. Pierce, who had been in charge of the work in the region for many years reached the retirement age in September and Mr. J. C. Ball, who had assisted Mr. Pierce for a number of years, became the new regional leader.

R. W. Welch and W. V. Zimmer, the area and assistant area leaders of the newly formed area (number two), have been engaged in blister rust control work in the Southern Appalachians since 1934.

Table I

Status of Control Work in West Virginia as of December 31, 1944

: White Pine:	: Control:	: Control:	: Control:	: Total:	: Total:	: Per Cent:	: Acres:
: Acreage:	: Acreage:	: Acreage:	: Acreage:	: Ribes:	: Man:	: Initial:	: On:
: In Control:	: In:	: Initially:	: Re-	: Destroyed:	: Days:	: Work:	: Mainten-:
: Area:	: State:	: Worked:	: worked:	:	:	: Completed:	: ance:
:	:	: (1)	: (2)	:	:	:	: (3)
: 307,653	: 832,816:	: 822,865	: 81,766	: 6,435,227:	: 58,004:	: 98.8	: 629,170:

(1) 271,062 acres bore ribes, 551,803 acres bore none

(2) Ribes-bearing acreage only

(3) Acreage needing a minimum of attention within the next ten years

SUMMARY OF BLISTER RUST CONTROL WORK IN 1944

Ribes eradication, post checking and resurvey were conducted in four counties of the state in 1944, those counties being Pocahontas, Pendleton, Hardy and Greenbrier. In Pocahontas and Greenbrier Counties, work was performed on the Monongahela National Forest and private land, while in Pendleton and Hardy Counties work was accomplished on the George Washington National Forest and private land.

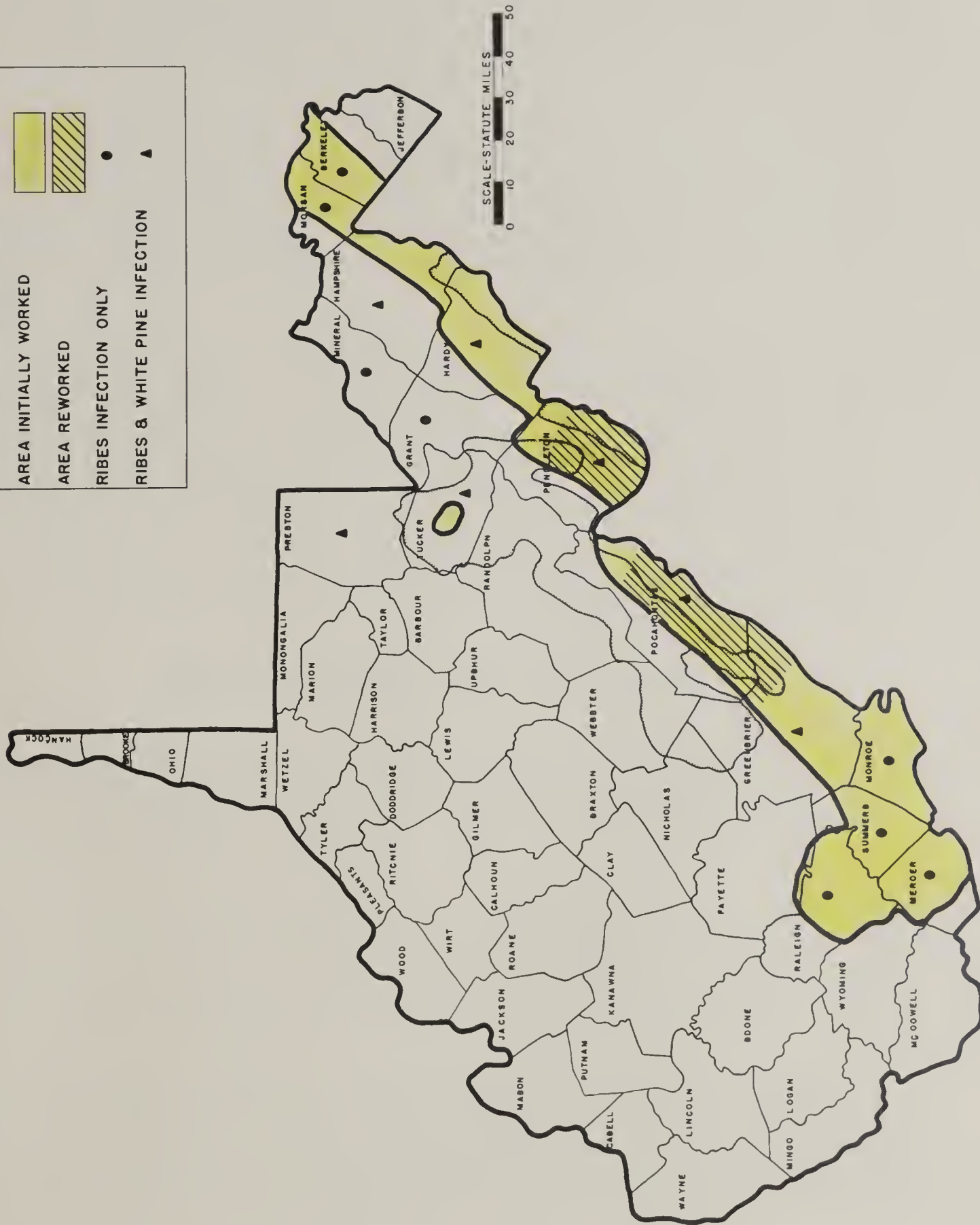
WHITE PINE BLISTER RUST CONTROL STATUS MAP

STATE: WEST VIRGINIA

STATUS AS OF: DEC. 31 1944
MONTH DAY YEAR

LEGEND

- CONTROL AREA BOUNDARY
- NATIONAL FOREST BOUNDARY
- AREA INITIALLY WORKED
- AREA REWORKED
- RIBES INFECTION ONLY
- RIBES & WHITE PINE INFECTION



In Pocahontas County the ribes eradication program was conducted over 12,902 acres of ribes-bearing land, principally of private ownership, which had been worked initially in 1936 - 1937. The effectiveness of the initial working in reducing the ribes population can well be demonstrated by comparing the average number of bushes destroyed in the first working with the number found on the second working. When initial work was performed seven to eight years ago, ribes were growing at the average rate of 35 bushes per acre on private land. On the acreage worked for the second time in 1944, ribes were found at the average rate of only eight bushes per acre.

Likewise, in Greenbrier County, ribes decreased from an average of 23 per acre on first working to slightly less than three per acre on second working in 1944, about six years after completion of the first working. In Pendleton County, similar decreases were noted. Thus, it becomes apparent that ribes growth is rapidly being decreased on control areas within the state, and thus the danger of damage from blister rust infection also is being decreased.

In all, 21,103 acres of ribes-bearing land were worked during the year, 98% of which was second working and the remainder first working. A total of 199,259 ribes were destroyed. To date, 81,766 acres of ribes-bearing land have been worked twice in the state, leaving 189,296 acres yet to rework before completion of the second working is achieved. After completion of the second working, it is estimated that ribes growth will have decreased to the point that 90% of the ribes-bearing acreage within the state will need additional workings only at ten year intervals, and that only about 30,000 acres will need workings at five year intervals. See status map on page 76.

DETAILS OF CONTROL OPERATIONS IN 1944

In Pocahontas County, ribes eradication work was performed, for the most part in the area surrounding Dunmore and Greenback on Deer Creek and Rosin Run. By the end of the 1945 eradication season second coverage will have been completed throughout the county.

The work in Greenbrier County during the year was on Spice Run, Anthony Creek (north of Neola), Meadow Creek, and North Fork of Anthony Creek. The come-back of ribes in this area is light and it is probable that most of the areas covered this year will definitely fall within the maintenance class, needing only a minimum of attention for the next ten years.

In Pendleton County, work was confined to the pine belt extending eastward from the South Branch of the Potomac River on areas within the George Washington National Forest and intermingled private lands. In Hardy County, a survey program was operated for a part of the year to determine the amount of eradication work which will be necessary in the next year or so.

During 1944, the work was carried on under appropriations made by the Conservation Commission of West Virginia, the U. S. Bureau of Entomology and Plant Quarantine and the U. S. Forest Service. State and Bureau funds were utilized for protecting privately owned white pine and for meeting overall

expenses Forest Service funds were used in connection with the work on the Monongahela and George Washington National Forests and on closely intermingled private lands.

Due to the heavy war time demands upon the supply of manpower in the state, youths of high school age were used extensively during the summer months. In general this source of labor proved adequate and efficient. The youths were organized in crews of from three to five per crew and were supervised by older men with previous training. Each crew engaged in eradication work was supplied with and trained to use a "chemical kit" containing applications of salt and borax, equally mixed, three ounces per application. This chemical was applied to the root systems of ribes bushes growing in rocky places where the removal of the root systems by hand would have involved a considerable amount of time. About 300 pounds of chemicals were used in this fashion during the eradication season.

Various types of checking crews were used during the year to gather needed information. Survey units mapped the pine areas to determine the location and the density of the stands. This phase of the work was accomplished by taking sample counts at 1/8 mile intervals from established base lines, each strip covering an area 1/4 chain in width. In this manner 46,45 acres of white pine and 109,722 acres of control area were examined and mapped during the year, chiefly in the winter months.

In the growing season, post checks were conducted over areas where ribes had been destroyed in previous years. A total of 28,759 acres of control area were examined at the average rate of 142 acres per man day. In those cases where the results of the post check indicated sufficient ribes growth to endanger white pine, the areas in need of working were marked and eradication crews were sent in to perform the task of removing the ribes bushes. After completing the necessary eradication work, the crews moved on to other areas marked by the post checking unit, but following the eradication work, each ribes-bearing area was examined by a regular check unit to determine the quality of the eradication job, and to determine if additional work might be necessary in order to bring down the number and size of the bushes to a point considered safe. In this manner 18,464 acres of ribes-bearing land were examined, but a reworking was found unnecessary except in a very few individual cases.

Table II

Summary of Ribes Eradication in West Virginia 1944

Agency	Acres		First Working			Second Working		
	Worked	Free	Ribes	Acres	Man	Ribes	Acres	Man
			Destroyed		Days	Destroyed		Days
Bureau & State						(1)		
(Private Lands)	351	217	8,941	69	12,031	99,204	2,358	
Forest Service						(2)		
Monongahela	-	-	-	-	3,788	11,240	931	
Forest Service						(3)		
Geo. Washington	-	251	13,029	118	4,816	86,618	1,399	
Forest Service								
Sub-totals	-	251	13,029	118	8,604	97,858	2,330	
						(4)		
TOTALS	351	468	21,970	187	20,635	197,062	4,688	

- (1) An additional 11,557 acres examined was free of ribes
 (2) An additional 18,309 acres examined was free of ribes
 (3) An additional 33,419 acres examined was free of ribes
 (4) An additional 63,285 acres examined was free of ribes

COOPERATION

Two Federal agencies (Bureau of Entomology and Plant Quarantine and Forest Service) and two State agencies (Conservation Commission of West Virginia and West Virginia Department of Agriculture) cooperated in effecting the control program conducted in 1944.

The Bureau of Entomology and Plant Quarantine provided the majority of the funds necessary in payment of salaries for supervisory employees and in addition provided a sufficient amount of funds to match the amount made available by State appropriations. The Forest Service appropriated sufficient funds to conduct all phases of the control program within the two National Forests in West Virginia.

The Conservation Commission of West Virginia, directed by Mr. Jack K. Shipman, provided \$5,000.00 through a biennial legislative appropriation for conducting blister rust control work on state and privately owned land. This cooperative fund was administered through the Commission's Division of Forestry headed by Mr. D. B. Bonebrake, Acting State Forester. Although the State Department of Agriculture made no direct appropriation, Mr. F. Waldo Craig, Entomologist, rendered valuable services through the handling of quarantine measures and nursery inspections.

WHITE PINE: PRODUCTION, VALUES, REPRODUCTION

Accelerated cutting of all types of timber to satisfy heavy war-time

demands has resulted in a great increase in the white pine cut in West Virginia during the last two years. In 1943, white pine lumber production in the state was four times that of 1942, and although complete figures are not available for the 1944 production, it is expected that this year's output will approach the 1943 figure, but not exceed it. Since 1942, it is estimated that not less than 34,000,000 board feet of white pine has been converted to lumber products in the state, the stumpage value of which is conservatively estimated at one-third of a million dollars. The finished lumber products from this cut would range in market value from \$1,000,000 to \$1,500,000.

The unprecedented demand which has been created in recent years has resulted in a sharp up-rise in stumpage prices. One small tract of white pine in Greenbrier County within the Monongahela National Forest brought the U. S. Forest Service the record stumpage price of \$20.25 per M board feet. Pre-war prices ranged from \$5.00 to \$8.00 per M board feet.

Natural reproduction of white pine is undoubtedly increasing in the state, and new acreage is steadily being added within our control areas. This increase is especially noticeable within State and Federally owned tracts controlled within the past decade.

Typical examples of increased pine acreage are to be had in Seneca State Forest where the acreage figure has increased from 2,000 to 3,000 acres; in Watoga State Park, whose pine acreage has doubled in the past decade due to a spread of natural reproduction; and in the Monongahela National Forest where the increased acreage ranges from 30% to 40% in the past decade. The reproductive spread of white pine has also been appreciable on private land within the purchase units of the Monongahela and George Washington National Forests in Pocahontas, Greenbrier and Pendleton Counties. The block map on page 81 illustrates the white pine acreage increase over several years.

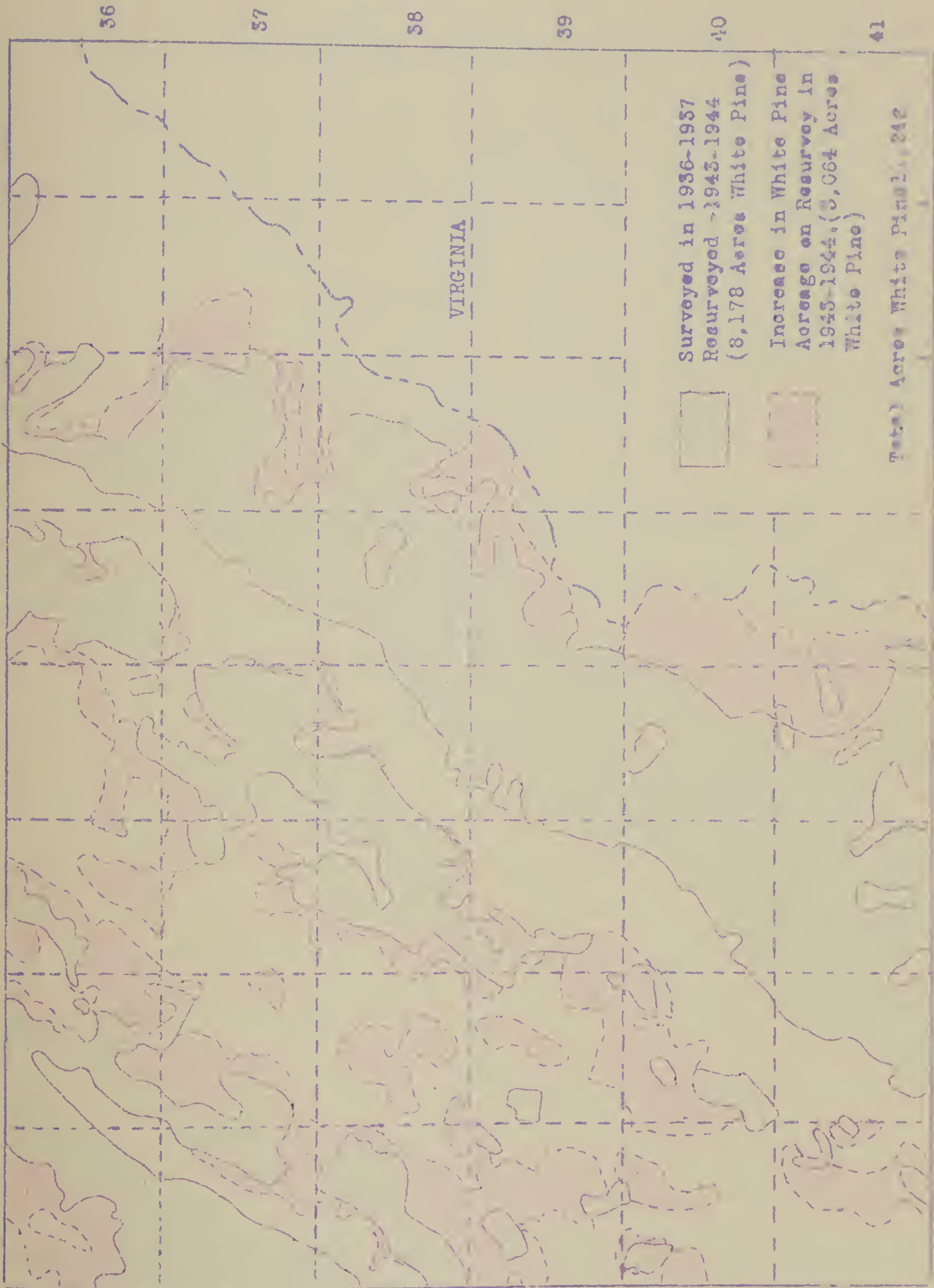
PERSONNEL EMPLOYED

At the peak of the eradication season, a total of 102 employees were engaged in blister rust control work, but during most of the season far fewer were employed. Sixteen and seventeen year old youths of high school age were used quite extensively during the summer months and as a whole their services proved very satisfactory. In spite of the ever-growing general manpower shortage, a sufficient amount of labor was recruited to conduct the work as had been previously planned, although this might not have been possible if recourse had not been made to the pool of teen aged youths during the summer months.

In general, the season was a very successful one in so far as accomplishments were concerned, as exemplified by the fact that more ribs were destroyed and more acreage covered than in any previous year since the beginning of the war.

MAP SHOWING INCREASE IN WHITE PINE AREAS INDICATED BY
 RESURVEY IN 1943-1944. ORIGINAL SURVEY IN 1936-1937.
 BLOCK #26, POCAHONTAS COUNTY, WEST VIRGINIA.

(Scale:- 1 inch equals 1 Mile)



FIELD STUDIES

An extensive study was conducted in the vicinity of Dunmore, Pocahontas County, surrounding a single ribes bush. The results of the study were set forth in the form of a technical paper. Proof was established that no less than 91 trees had become infected from spores disseminated by the one bush over a ten year period. Forty two percent of the trees over an area of four tenths of an acre immediately surrounding the bush had become infected. The rate of infection depended directly upon the distance of the pines from the ribes bush. At a distance of 26.4 feet, 60% of the pines were infected; at 52.8 feet, 47% were infected; at 79.2 feet, 24%; at 105.6 feet, 19% and at 132 feet, 8% were infected.

CANKER ELIMINATION

One canker elimination project was conducted in northern Greenbrier County within the Monongahela National Forest, on an area where ribes had not been eradicated until this year. The area provided an excellent demonstration of the amount of damage to be expected from blister rust on uncontrolled areas.

The age of the cankers indicated that the first infection had occurred in this area in 1933. In the first decade of exposure, a total of 6,506 trees had become infected within a 19 acre tract of young growth white pines, or 41% of the entire stand. Of the total number of infected trees 4,838 or 74% were either dead or lying from the growth of the fungus. The remainder of the infected trees were treated by removing a total of 8,385 branch cankers. The examination and treatment of this tract involved 132 man-days of labor and therefore costs were high, approaching \$30.00 per acre. However, much benefit was gathered through a study of the data collected, from which the ground work for future canker elimination projects can be laid.

The project was of a dual nature with two objectives in view: (1) To eliminate the heavily infected trees and treat those lightly infected, thus removing the source of aecia spore production and saving the lightly infected trees from ultimate death. (2) To determine the amount of infection developing within uncontrolled areas and the feasibility of practicing canker elimination work on heavily infected areas. The results of the project were summarized in the form of a technical paper. Because of the high costs involved in attempting to make a complete canker elimination job in a heavily infected native stand of white pine, it is recommended in the future that only selected crop trees be considered for treatment following the removal of all ribes within the area.

NURSERY SANITATION

Mr. F. Waldo Craig, State Entomologist, conducted his yearly inspection of nurseries within the state, from which he determined that 26 nurseries have white pine within their boundaries, either of planting size or as ornamentals on the nursery grounds. There are only two nurseries within the state, however, that grow white pine in commercial quantities, those

two being the State Division of Forestry's large nursery at Lesage, West Virginia, and the U. S. Forest Service's large nursery at Parsons. The State nursery, at the present time, is the largest producer of white pine, having a total of 328,000 seedlings. Wild ribes do not grow in the nursery environs. At Parsons, white pine production as well as production of practically all species has been seriously curtailed during the war years, and only 2,500 white pine seedlings are on hand. Wild ribes have been found in the environs of the Parsons nursery. The control acreage was thoroughly worked in 1943 and another examination will be made in 1945.

Table III

Cost of Control Work In 1944

	Amount	Balance of Funds Available	Cost Per Acre		
			Ribes Eradication		
Operating Agency	Expended Jan. 1 - Dec. 31, 1944	Jan. 1 - June 30, 1945	Initial Work	Rework	Survey
Bureau					
Ent. & Plt.					
Quar. (3103)	8,240.30	1,545.18	-	-	-
State -					
Conservation	(1)	(1)			
Commission	5,910.18	1,727.03	-	-	-
Total -					
Cooperation	14,150.48	3,272.21	1.35	1.11	0.05
Forest Service					
Monongahela	9,462.14	3,467.47	-	1.52	0.07
Forest Service					
Geo. Wash.	12,376.92	5,459.68	2.83	1.66	0.07
Total -					
For. Service	21,839.06	8,927.15	2.83	1.60	0.07
TOTAL					
ALL FUNDS	35,989.54	12,199.36	2.36	1.33	0.06

(1) Cash only, exclusive of contributed services (Including contributed services (direct aid) a total of \$6,120.18 was expended during the year)

RECOMMENDATIONS FOR FUTURE WORK

The work plan for the 1945 calendar year calls for completion of the second eradication program in Pocahontas County, and thereafter, very little work will be needed in that county for the next few years.

In Greenbrier County second working should be completed within the Monongahela National Forest and possibly as much as half of the private land in that county will be reworked.

Second working in Pendleton County is well along towards completion, and a start will be made on the second working program in Hardy County. It is probable also that some amount of work will be accomplished in Tucker County during the year, and a resurvey may be undertaken in either Raleigh or Monroe County in the latter part of 1945.

The probability exists that manpower shortages may be even more acute than in 1944, and it is entirely possible that the program in 1945 may be effected to some extent, necessitating some amount of curtailment in certain localities. High school youths will again be used, wherever it is practical to do so.

PART IV

Work Project BLR-4

Detailed Reports on Blister Rust Control on National Forests - 1944

By

Henry E. Yost, P-3, Area Leader, Area No. 1

H. B. Teague, P-2, Assistant Area Leader

Ralph W. Welch, P-3, Area Leader, Area No. 2

W. V. Zimmer, P-2, Assistant Area Leader

WHITE PINE BLISTER RUST CONTROL
IN THE
GEORGE WASHINGTON NATIONAL FOREST
1944

H. E. Yost Area Leader Blister Rust Control, Area No. 1

R. W. Welch, Area Leader Blister Rust Control, Area No. 2

That part of the George Washington National Forest which is in West Virginia is handled as a part of Area 2 in the Southern Appalachian Blister Rust Control Region. In like manner the remainder is in Area No. 1. This report is prepared by both area leaders and covers the Forest as a whole.

A small amount of work was carried on in the vicinity of North River, Dry River Ranger District, from 1929 to 1933. When the CCC and other relief programs the work was stepped up and the best stands of white pine were surveyed, and for the most part protected by one or more workings, from 1934 to 1939. It was found that land acquisition and extensive natural reproduction of white pine made a resurvey necessary, which was begun in 1940 and is now in progress. This resurvey is approaching completion in the Deerfield and Dry River Ranger Districts. In practically all cases the resurvey is showing large increases in the white pine acreage and frequently showing more than double that reported originally.

A reworking generally follows the resurvey where found necessary, however, due to manpower shortages and other reasons there has been some lag. There is now surveyed and ready a sufficient amount of ribes eradication work to require over 100 men for one summer. With more emphasis on survey, much additional eradication work can be made ready in a few months.

The following table gives a resume of the status by States:

Table I

Status As of December 31, 1944

: State:	: White Pine:	: Control:	: Control:	: Control:	: Total	: Total:	: Per Cent:	: Acres
: : Area	: In	: Initially:	: Re-	: Destroyed:	: Days:	: Work	: Mainte-	
: : Forest	: Worked	: worked	:	:	:	: Completed:	: ance	
: Va. :	142,188	:262,921:	239,825	:35,976	:2,578,051:	25,245:	91	:169,759
: W. Va. :	21,282	: 48,668:	48,668	: 6,855	: 711,896:	6,951:	100	: 28,692
: :	:	:	(1)	:	:	:	:	:
: TOTAL:	163,470	:311,589:	288,493	:42,831	:3,289,947:	32,196:	92.5	:198,451

(1) Of the total acres initially worked 179,255 acres are ribes-free and 110,238 ribes-bearing.

These figures represent the entire forest on the original work, and the resurvey and reworking on most of the Dry River and Deerfield Districts; a small amount on the Lee and Pedlar Districts and none on the Warm Springs District. On this basis we can expect a complete resurvey to show approximately 200,000 acres of white pine with a control area of over one-half million acres, of which probably three-fourths will be naturally ribes-free.

The long range problem on ribes-bearing land will depend on many factors, however, on most of the area it probably will not be serious.

accurate data for that part in West Virginia shows ribes present, at the time of the first working, at the rate of 29.9 bushes per acre; at the time of the second working, from 3 to 6 years later, at the rate of 16.5 per acre. As the forest develops and is managed on a sustained yield basis the closed canopy will tend to suppress ribes and materially aid in the rust control work.

BLISTER RUST CONTROL WORK IN 1944

Table II

White Pine and Control Area Surveyed in 1944

					Acres	Approximately
State	50 or more	Under 50	Total	Control	Acreage	
	stems per	stems		Area	Resurvey	
	acre	per acre		Mapped	Completed	
Va.	16,465	540	17,005	60,504	246,256	
W. Va.	8,364	6,280	14,644	38,550	38,550	
TOTAL	24,829	6,820	31,649	99,054	284,806	

White Pine Survey

White pine survey was completed on 86 square-mile units in West Virginia and 197 in Virginia. In West Virginia this survey was performed over the same areas which were originally surveyed several years ago when initial ribes eradication work was performed. The "resurvey" is considered necessary in order that maps might be brought up to date, showing increases in pine acreage due to natural reproduction of diseases due to cutting, burning, etc. The resurvey program is more systematic than the original survey, and is based on the mile square grid system. A $2\frac{1}{2}\%$ representative sampling at pre-designated intervals is used throughout the areas of the forest in which white pine is an important forest species.

The resurvey program was begun in the southern portion of the Dry River Ranger District in 1943. During the current year the resurvey steadily advanced northward until the whole of the Dry River District had been completed. In the fall, operations were opened in the Lee Ranger District, near Wardensville, and it is believed that a large percentage of all necessary resurvey work in that district will be completed by the Spring of 1945.

Since the time of the original survey, white pine seemed to reproduce more extensively in Virginia, which made it necessary to cover much land that had not previously been mapped. In most cases it was found impossible to determine, with any accuracy, the location of the old pine areas. This made it practically impossible to make any comparison between the two surveys except on the basis of county or ranger district totals. Previous to the Fall of 1944 the grid survey was made independent of the Forest Service lines and corners. At the suggestion of Mr. M. C. Howard, Supervisor, the one-mile

square lines were overlaid on Forest Service property maps (4" to 1 mile) and only the east-west lines were established on the ground. These lines are based on class A and other Forest Service corners. The results so far indicate an average saving of about 4.7 man-days per grid on the survey, in addition to providing a more accurate ground control

Ribes Eradication

Table III

Summary of Ribes Eradication in 1944

State	Acres				Ribes Destroyed	Man Days	Approximate Acreage Remaining to be Worked*
	Free	Control	Initial	Rework			
Va.	30,520	5,621	3,780	9,401	262,375	2,724	23,000
W. Va.	-	251	4,816	5,067	99,647	1,517	3,000
TOTAL	30,520	5,872	8,596	14,468	362,022	4,241	26,000

*Includes only that part reworked to date.

Ribes eradication work in West Virginia was conducted principally in the central section of that part of the Dry River Ranger District falling within that State. Second working has now been completed on more than two-thirds of the district, including all of the area south of Rough Run, as well as a part of the area north of Rough Run. Local labor was recruited in the community surrounding Brandywine. The maximum number of employees did not exceed 22 at any time during the ribes eradication season. All laborers were certified to our project by the War Manpower Commission, who offered their fullest cooperation.

All ribes eradication work in Virginia was confined to the Dry River Ranger District. Since a substantial percentage of the ribes found on reworking are sprouts from improperly removed bushes, much emphasis was placed on the use of salt-borax on ribes roots which are difficult to remove. In many cases large bushes are decapitated with hand pruners and from $\frac{1}{4}$ lb. to $\frac{1}{2}$ lb. of the salt-borax applied to the crown. This saves much time, gives a more thorough job and tends to keep the men conscious of the necessity to pull out or salt the crowns or roots. Slightly over 100 lbs. of this chemical were used during the season.

In the lighter ribes concentrations a three-man crew was used and a five-man crew was used where the bushes ran heavy. Some rework was necessary but generally the quality and quantity of the eradication work was satisfactory

Results of Checking

A five percent check was made of all ground on which ribes eradication was performed. A total of 147 man-days were required to make regular checks

on 14,468 acres. The checking was performed by one man or two-man crews, depending on the field conditions. In addition to the formal 5% checks, general checks were made on the crews and checkers by the supervisory men.

Since the resurvey is usually carried on during the dormant season when ribes are most difficult to locate, particularly when about all the large bushes have been destroyed some years previous, it is sometimes necessary to make a post check just before ribes eradication work. Such checks were made on 7,776 acres using 79 man-days. These checks are usually made in the same manner as the regular checks.

Cost of Blister Rust Control In 1944

The following table recapitulates the costs of various phases of the control program conducted during the current year:

Table IV :
Cost of Forest Service Operation and Cost Per Acre
on Rework and Survey

State	Labor	Supervision and Operation	Total	Cost Per Acre		
				Ribes Eradication		Survey
				Initial	Subsequent	
Va.	19,524.46	4,853.26	24,377.72	1.66	1.51	0.11
W. Va.	9,589.64	2,787.28	12,376.92	2.66	1.66	0.07
TOTAL	29,114.10	7,640.54	36,754.64	1.74	1.59	0.09

The increase in wage rates, together with the reduced quality of laborers now available, tends to increase materially the cost per acre of any phase of the control work. This was partially offset by improved methods and closer supervision.

WORK SCHEDULE FOR 1945

In West Virginia, during the early part of 1945, resurvey operations will continue within the Lee Ranger District. Ribes eradication will be resumed in the Dry River Ranger District in May and will continue until completed. It is expected that all resurvey work will be completed by near the end of June. For the remainder of the growing season ribes eradication will be concentrated in the Lee District, although it is doubtful if all necessary work can be completed in that district before mid-summer of 1946.

After completion of the second working, probably in 1946, the majority of the control acreage within the forest in West Virginia will be on a maintenance basis, although a part of the acreage will need a third working in 1946 to 1950

In Virginia, survey will be continued until about May.1, but which time the survey of the Dry River Ranger District should be completed. Probably all

survey on the Deerfield District will be completed except for that part in Rockbridge County. In the Fall of 1945 survey work will be resumed about October 1 and continue in the War Springs, Deerfield and Lee Districts. By December 31 it is hoped that the survey will be completed for the last two districts.

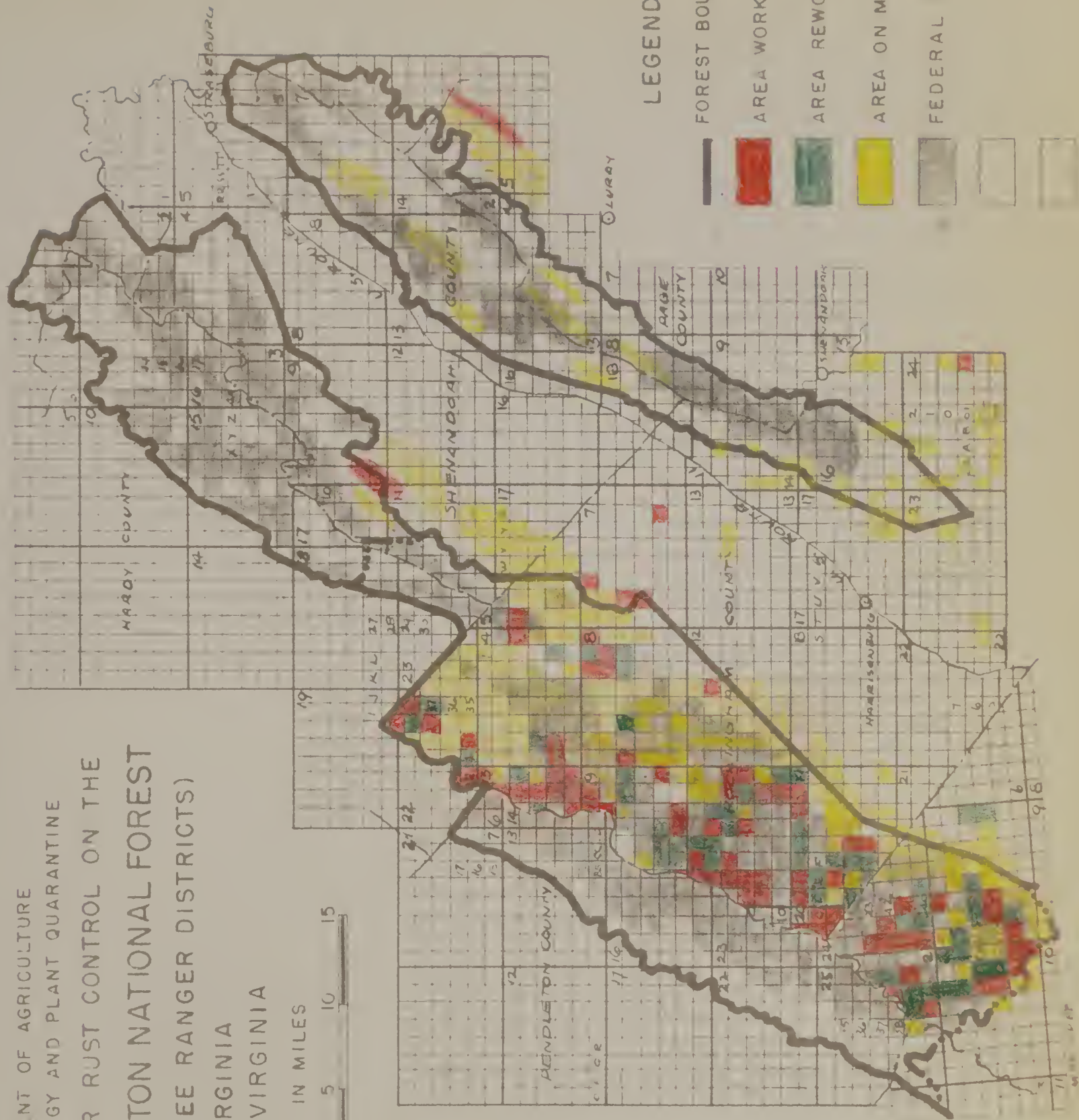
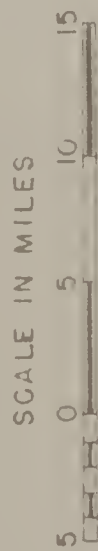
During the period of May 1 - September 30, probably all eradication work will be confined to the Dry River and Deerfield Districts. It is not likely that ribes eradication will be completed for these districts during 1946 as over 23,000 acres have been surveyed to date that have not been worked. Wherever practicable we are going ahead with survey and doing ribes eradication when labor becomes available.

At our present rate of coverage we can expect the survey of the entire forest to be completed by the end of 1946 or sometime in 1947. No similar estimate can be made at present on ribes eradication.

The following three pages are progress maps for the Dry River and Lee, the Warm Springs and Lee and the Pedlar Ranger Districts.

U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
GEORGE WASHINGTON NATIONAL FOREST
(DRY RIVER AND LEE RANGER DISTRICTS)

VIRGINIA
WEST VIRGINIA



LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY
- AREA REWORKED
- AREA ON MAINTENANCE
- FEDERAL LAND

NOTE: GRID NUMBERS
SHOWN ON COUNTY
INDEX MAPS

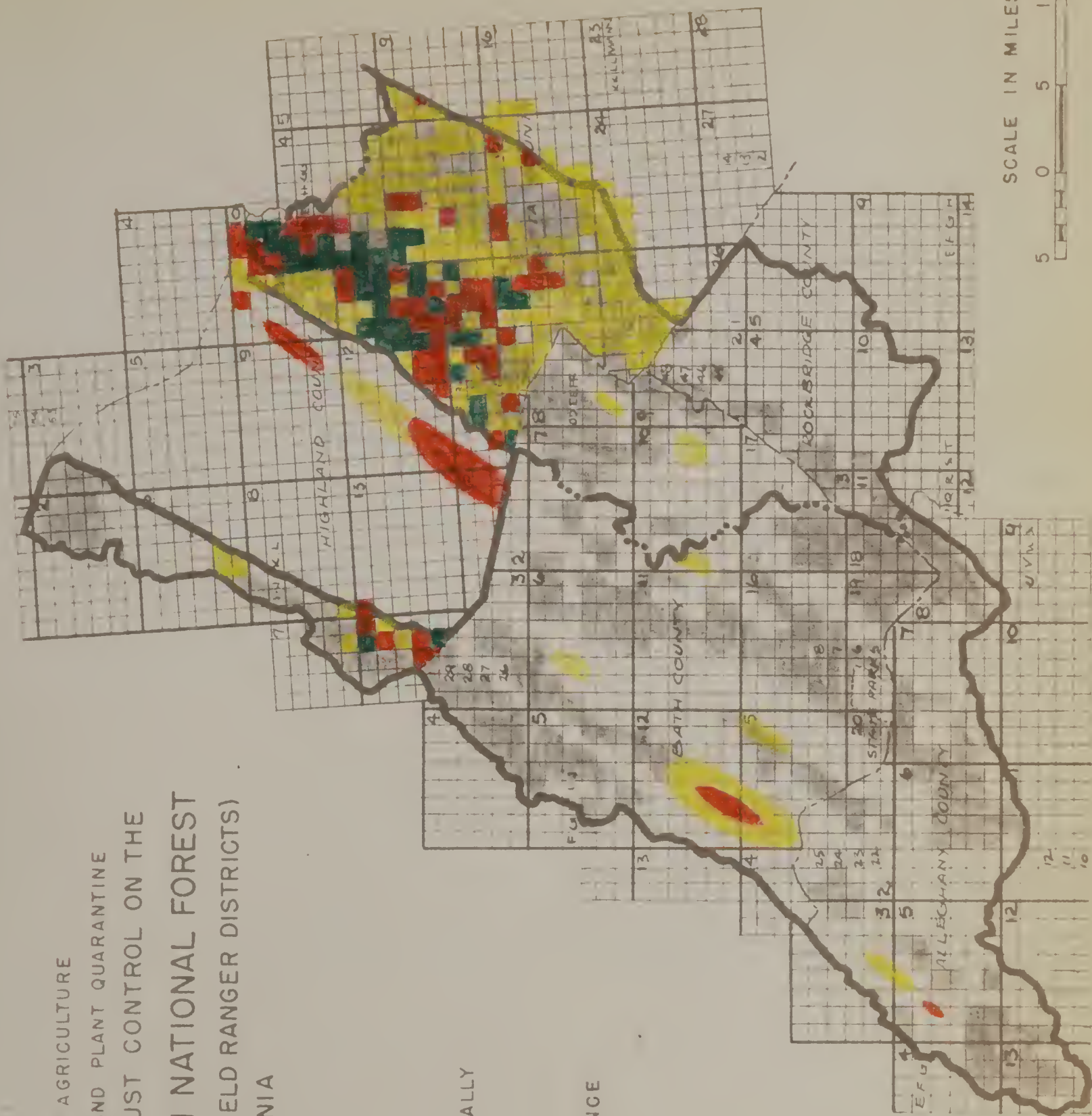


U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
GEORGE WASHINGTON NATIONAL FOREST
(WARM SPRINGS AND DEERFIELD RANGER DISTRICTS)
VIRGINIA

LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY
- AREA REWORKED
- AREA ON MAINTENANCE
- FEDERAL LAND
-
-

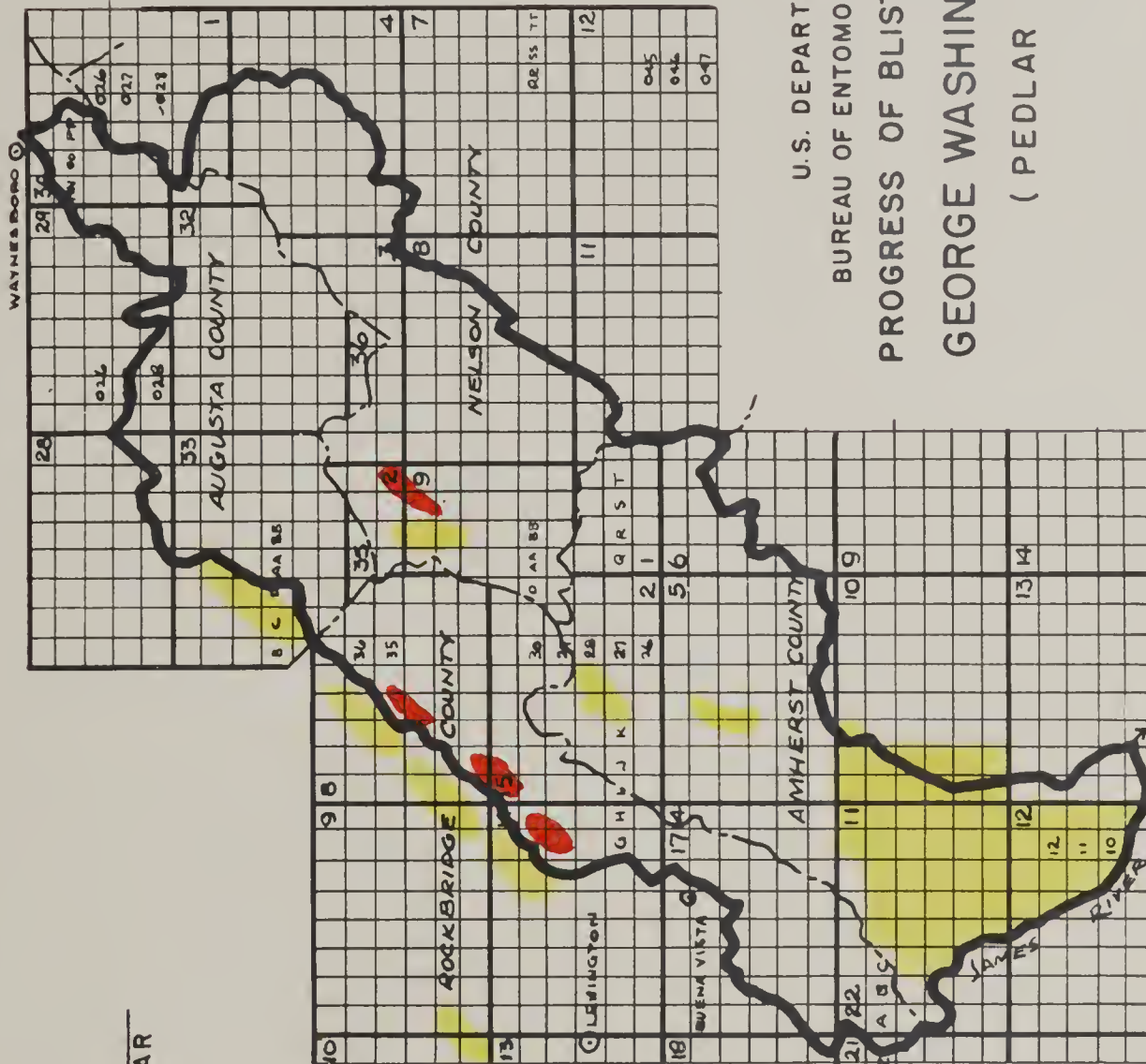
NOTE: GRID NUMBERS
ON COUNTY INDEX
MAPS



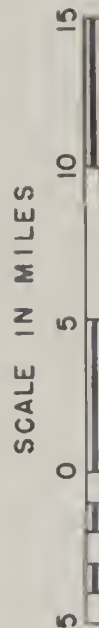
LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY YEAR
- AREA REWORKED YEAR
- AREA WORKED INITIALLY
- AREA REWORKED
- AREA UNWORKED
- Area on Maintenance

NOTE: GRID NUMBERS SHOWN ON COUNTY INDEX MAPS.



U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
GEORGE WASHINGTON NATIONAL FOREST
(PEDLAR RANGER DISTRICT)
VIRGINIA



WHITE PINE BLISTER RUST CONTROL

JEFFERSON NATIONAL FOREST

1944

By

Henry E. Yost, Area Leader, Area No. 1

H. B. Teague, Asst. Area Leader, Area No. 1

STATUS OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1944

A survey of the best stands of white pine on what now comprises the Jefferson National Forest was made from about 1933-1937. During this period most of the pine stands were protected by one or in some cases two workings. General scouting from 1938-1941 indicated that white pine was spreading rapidly by natural regeneration. During 1940 the blister rust spread from Northern Virginia over most of the Jefferson National Forest and on into North Carolina. Resurvey and ribes eradication work were found necessary, and work was begun in the northern end of the Forest in 1943. It was intended to carry through this work to the southern boundary. However, after completion of the Glenwood and a small part of the New Castle Ranger Districts manpower conditions made it necessary to suspend the work here but we were able to begin on the southern boundary. All resurvey and some ribes eradication work is complete in the southern portion of the Holston District and resurvey is progressing in that part of the Wythe District in Carroll, Grayson and Wythe Counties. To date blister rust has been found on ribes in 13 counties covering most of the Forest except the Clinch District. The disease was found on white pine in five of these same counties. No extensive killing of pine has been observed to date.

The following table and maps show the status at the present time:

Table I

Status As of December 31, 1944

:White Pine:	Control:	Control:	Control:	Total	:	Total:	Percent	:	Acres	:					
:In Control:	Acreage:	Acreage:	Acreage:	Ribes	:	Man	:	Initial	:	On	:				
:Area	:	In	:Initially:	Re-	:	Destroyed:	:	Days	:	Work	:				
:	:	Forest	:Worked	:worked	:	:	:	Completed:	:	Mainten+	:				
:	:	:	:	:	:	:	:	:	:	:	:				
:	:	:	:	:	:	:	:	:	:	:	:				
:	47,600	:	90,651	:	89,287	:	2,940	:	1,921,967	:	14,905:	98 **	:	76,937	:

*These figures include some intermingled privately owned lands.

**Represents only that part surveyed to date.

BLISTER RUST CONTROL WORK IN 1944

White Pine Survey:

White pine survey by the grid system was completed in the southern part of the Holston District during 1944. Work was started in February west of Damascus with 5 men, and due to bad weather there was some delay in the beginning. In March a crew from Konnarock continued the work until it was completed in November. Work was then resumed with a new crew from Speedwell but due to unfavorable weather, slow progress was made during the remainder of the year.

There was evidence of good white pine reproduction in all areas having white pine seed trees, with the young white pines extending several hundred yards outside the previous white pine areas. This reproduction is increasing the density of white pines in the original white pine areas as well as helping to restock border zones where chestnuts were killed by the blight. In general the young trees are making good growth and are standing up well under competition with other species.

The following table shows the survey work performed during the year:

Table II

Acres White Pine Mapped			Acres in: Approximate	
50 or more:	Under 50:	Total	Control	Grid Survey
stems	stems		Area	Completed
per acre	per acre		Mapped	Thru. Acres 1944:
12,264	10,704	22,968	46,057	69,737

Ribes Eradication

Ribes eradication work was performed along Valley Creek in the Taylors Valley section and in the Skulls Gap vicinity of the Holston Ranger District. Parts of both areas had been covered before but the resurvey included small areas containing ribes which had not been worked previously. Because of the lack of previously established control boundaries most of the ribes eradication work in 1944 is considered to be rework.

The ribes eradication crews encountered steep, rocky slopes and the areas covered near Taylors Valley had many cliffs and shaly slopes. In addition, most of the areas worked contained a great deal of dense underbrush with briars.

Workers on the project this year were from small farms and had crops to care for part of the time. There was not a single full-time laborer or foreman on the Jefferson work this year, and the workers took time off for working on their own or neighbors farms as needed.

After the first of April, good weather favored field work through October and the eradication crews and mappers made excellent progress. Bad weather set in again in December and very few days were worked due to snow, bad roads and rain. All field work was closed during November, during which time Assistant Area Leader Teague was in Harrisonburg most of the time attending a conference and working on reports, records and work plans.

A new crew from Speedwell began work early in December on the Wythe Ranger District in the Camp vicinity. Foreman, Corbett L. Boone and his crew made rapid progress in learning the work.

There were three species of ribes found on the Jefferson during 1944. Ribes Rotundifolium, the smooth gooseberry, was found near Taylors Valley. Ribes glandulosum, skunk currant, was found at two locations in the Skulls Gap section, one section being northwest of Skulls Gap down the creek from

where the Appalachian Trail leaves State road No. 600; the other location is east from Skulls Gap about $1\frac{1}{2}$ miles on the head of Little Laurel Creek. Ribes cynosbati, the prickly gooseberry, was abundant in the Skulls Gap area. Ribes were also found in the Hurrican Creek section but were not identified. They were gooseberries, but may have been cynosbati, rotundifolium or a mixture of both.

Although Ranger Sundheimer was not in the field with us, he had several conferences with Agent Teague during the year and assisted with information at hand. He also made several maps available which were very helpful in field work.

Table III

Summary of Ribes Eradication in 1944

Control Acreage Worked :				Acreage :			
Acres :	Ribes-Bearing:		Ribes :	Man :	Remaining :		
Ribes-:	Initial:	Rework:	Total:	Destroyed:	Days:	to be :	
Free :	:	:	:	:	:	Worked :	
:	:	:	:	:	:	*	:
:22,337:	310	:1,151	:1,461:	229,287	: 758 :	1,364	:

*Includes only that part resurveyed to date.

All of the ribes-bearing area covered this year was checked to determine the quality of the eradication work. Where it was found that ribes were left by the crew in excess of 25 feet of live stem per acre, a reworking was required. Some rework was necessary due largely to the inexperienced men and the heavy concentrations of ribes found in some localities. Some heavy concentrations were worked late in the season and a general examination will be made of these areas in the Spring of 1945 and further work will be done if necessary. The checking required 40 man-days.

COST OF BLISTER RUST CONTROL PROGRAM - 1944

Table IV

Cost of Forest Service Operation and Cost
Per Acre on Ribes Eradication and
Survey

Supervision :			Per Acre :		
Labor :	and :	Total :	Ribes Eradication:	Survey:	
:	Operation :	:	Initial :	Rework :	:
:	:	:	:	:	:
:7,381.06 :	2,186.89	: 9,567.95:	4.10	: 2.50	: 0.10 :

WORK SCHEDULE FOR 1945

The resurvey work will be continued until the southern part of the Wythe District is completed, which should be before June 30, 1945. These men will then begin ribes eradication work in the same vicinity. It is hoped that all ribes eradication work necessary will be completed in the Southern Holston District and such survey made as found necessary. A similar survey will then be made in the northern part of the Wythe District beginning in Wythe County. If the survey can continue moving northward through the forest at the present rate, the survey for the entire forest may be completed in 1947. Probably the necessary ribes eradication will follow fairly well but may not be completed until the next year.

The following pages are progress maps for the Newcastle and Glenwood and the Holston and Wythe Ranger Districts.

LEGEND

— FOREST BOUNDARY

- - - PURCHASE UNIT BOUNDARY

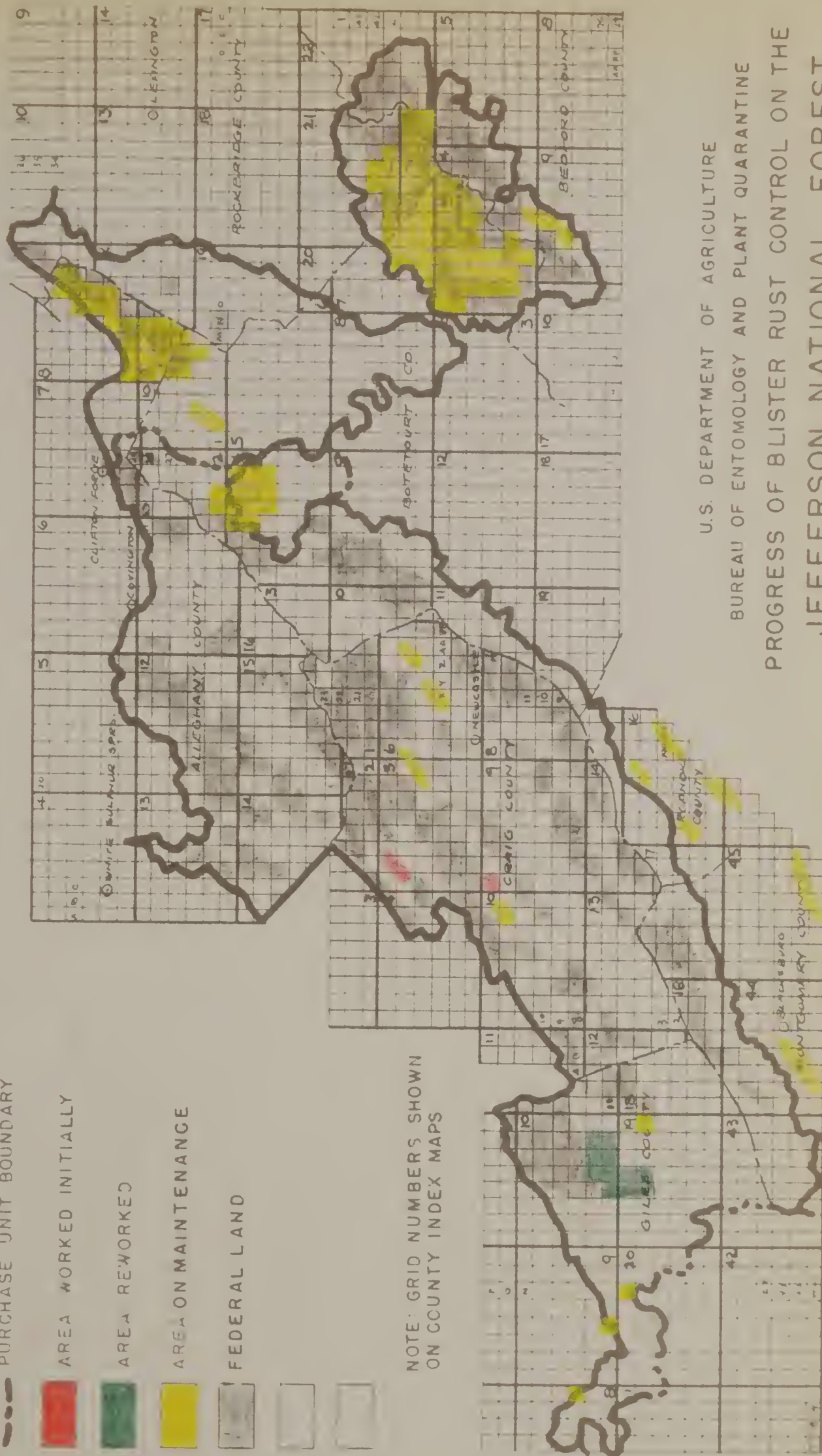
■ AREA WORKED INITIALLY

■ AREA REWORKED

■ AREA ON MAINTENANCE

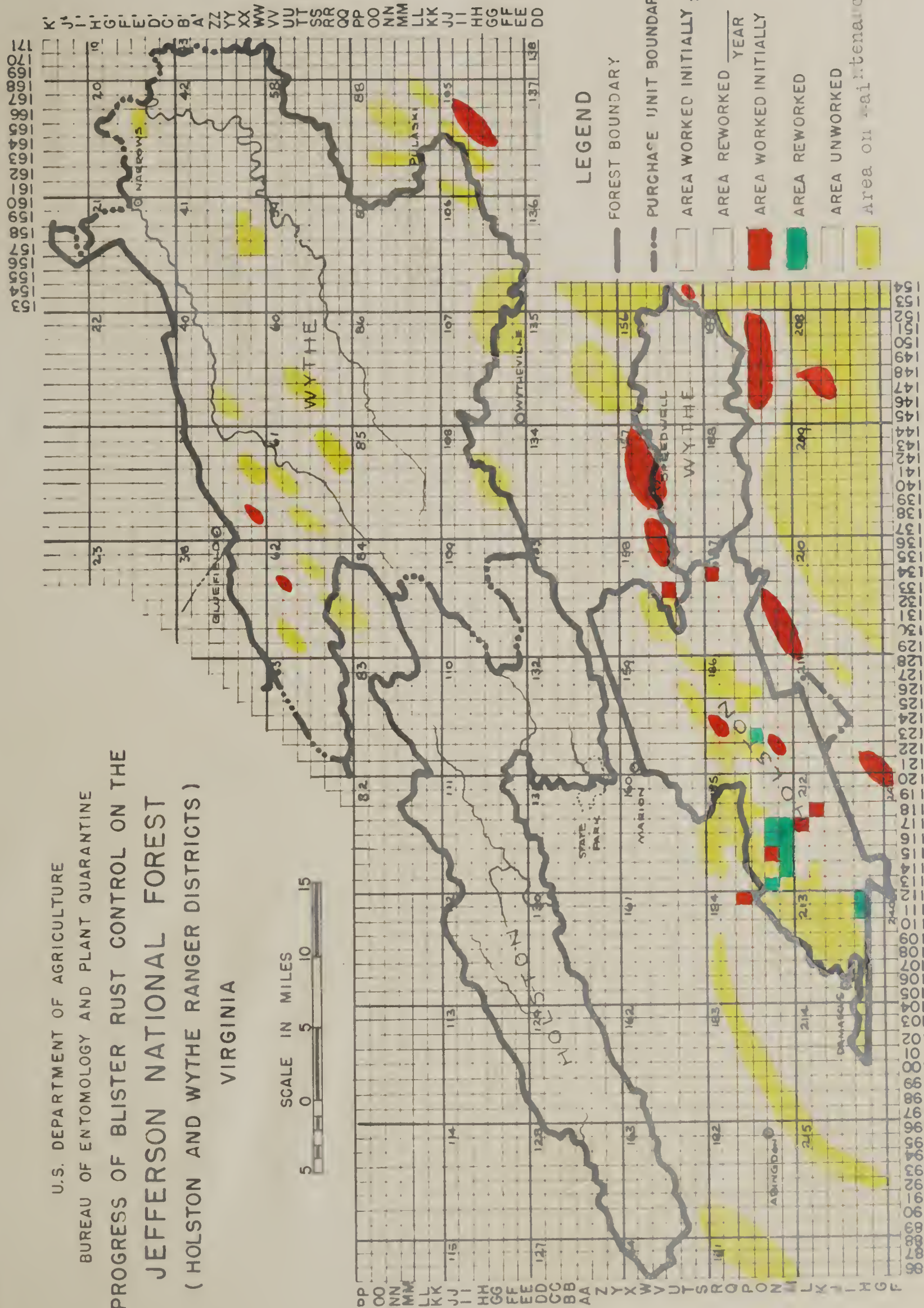
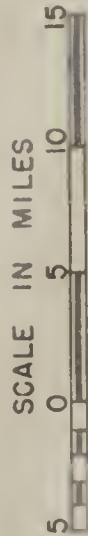
■ FEDERAL LAND

SCALE IN MILES
0 5 10 15



U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
JEFFERSON NATIONAL FOREST
(NEWCASTLE AND GLENWOOD RANGER DISTRICTS)
VIRGINIA

U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
JEFFERSON NATIONAL FOREST
(HOLSTON AND WYTHE RANGER DISTRICTS)
VIRGINIA



WHITE PINE BLISTER RUST CONTROL
IN THE
MONONGAHELA NATIONAL FOREST
WEST VIRGINIA
1944

By
Ralph W. Welch, Area Leader, Area No. 2

STATUS OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1944

Blister rust control work was first begun in the Monongahela National Forest in 1936 and three years thereafter, in 1938, a first working had been completed in Pocahontas and Greenbrier Counties, where at least 95% of the white pine acreage in the Forest is to be found. In the first working, 27,865 acres of white pine were protected by working 77,062 acres of control area, upon which 382,300 ribes were destroyed.

A second working program consisting of resurvey, post check and ribes eradication was begun in the Forest in 1943 and by the end of 1944 it is estimated that approximately 75% of all phases of the rework program have been brought to completion. The resurvey indicates that white pine acreage is rapidly increasing within the Forest. Revised figures for Pocahontas County, where the survey has been completed, reveals that the acreage of white pine has increased from 13,267 acres, as indicated by the original survey in that county, to 18,267 acres as of December 31, 1944. Likewise acreage figures have risen in Greenbrier County and it is expected that, upon completion of the resurvey throughout the Forest, the adjusted figures will approach 40,000 acres. The increase in acreage is due principally to the spread of native reproduction which has been aided by rigid fire control in the past decade.

The following table indicates the amount of control work which has been performed on the Monongahela National Forest since inception of the first blister rust control program in 1937:

Table I

Status as of December 31, 1944

White Pine:	Control:	Control:	Control:	Total	Total:	Percent	Acreage	
In Control:	Acreage:	Acreage:	Acreage:	Ribes	Man	Initial	On	
Area	In	Initially:	Re-	Destroyed:	Days	Work	Maintenance:	
	Forest	Worked	worked			Completed:		
		(1)	(2)					
33,120	92,970	77,062	9,933	427,561	5,990	85%	72,180	

(1) Includes 62,513 acres non-ribes bearing and 14,549 acres ribes-bearing.

(2) Includes only ribes-bearing land.

BLISTER RUST CONTROL WORK IN 1944

White Pine Survey

The white pine survey phase of the program was begun in the northern most part of the Forest and the work has gradually progressed to the southward. At the close of the current year, approximately 80% of the resurvey had been completed. In 1944, 13,550 acres of white pine were examined and

mapped by a percentage sampling method covering 2 $\frac{1}{5}$ % of the gross acreage. The total acreage mapped, including white pine and the 900 foot surrounding zone of protection amounted to 27,946 acres. This work was accomplished through the expenditure of 331 man-days of labor. Thus, an average of 92 acres of control area was examined and mapped per man-day, at an average cost of slightly under five cents per acre.

The table below summarizes the resurvey work conducted during the current year.

Table II

White Pine and Control Area Surveyed in 1944

Forest District (1)	50 or more stems per acre		Under 50 stems per acre		Total		Acres		Approximate	
	F. S.		Priv.		F. S.		Control Area		Resurvey	
	:		:		:		:		:	
Cheat	-	-	-	-	-	-	-	-	266	
Greenbrier	-	-	-	-	-	-	-	-	3,753	
White Sulphur	3,530	2,205	5,701	2,114	9,231	2,319	27,946		76,027	
TOTAL	3,530	2,205	5,701	2,114	9,231	2,319	27,946		80,046	

(1) White pine growth is insignificant in the two remaining Districts of the Forest: Gauley and Potomac.

(2) Includes acreage actually under Federal ownership.

(3) Includes acreage under private ownership, but closely intermingled with Federal land.

Ribes Eradication

Ribes eradication work, which is necessarily confined to the growing season, was begun in May and continued for a period of five months, ending in September. During this period, work was completed as needed over 51 square mile grids, covering a total of 22,957 acres of control area, incorporating 6,758 acres of federally owned white pine and 3,890 acres of closely intermingled pine under private ownership. Ribes were found growing over 3,788 acres of the total control acreage, and the remaining 19,169 acres were free of ribes growth. All ribes eradication was second working.

For the most part, the work program was confined to northern Greenbrier County on four watersheds; Anthony Creek (north of Neola), North Fork of Anthony Creek, Meadow Creek and Spice Run. A small amount of eradication was performed in Pocahontas County. Youths of high school age were used extensively in effecting the eradication program during the season, and their work proved very satisfactory. It is hoped that the eradication program can be completed by the end of June.

It is of interest to note that the number of ribes bushes per acre show a substantial decrease between first and second workings. An average of 26.2 ribes per acre were found and destroyed during the first working, whereas only 4.5 bushes are being found on the average acre reworked.

Table III

Summary of Ribes Eradication in 1944

Forest District	Initial Acreage	Control Acreage			Ribes Destroyed	Man Days	Acreage	
		Worked	Rework	Total			Remaining to be Worked	
Cheat	-	-	-	-	-	-	500	
Greenbrier	-	-	-	-	-	-	500	
White Sulphur	- *	-	3,788	3,788	11,240	930	3,000	
TOTAL	- *	-	3,788	3,788	11,240	930	4,000	

*19,169 acres blocked out as ribes-free by post check and/or resurvey. This acreage has previously been claimed as initially worked.

Results of Checking

Following completion of the eradication work performed by the crews, a checking unit examined closely a representative proportion of the acreage upon which ribes were found in concentrated numbers to determine the quality of the work. The check revealed that only a few small bushes had been missed at scattered intervals, and in no case was it necessary to rework any of the ribes-bearing acreage.

In locations where the presence of ribes bushes was doubtful, a post check was conducted to definitely determine the status of the areas. If ribes were found in sufficient quantities to cause spread of the disease, the areas in need of working were marked, and an eradication crew assigned to remove the ribes bushes. Thus, 13,518 acres of control area was examined in this fashion.

During the winter months of the year, a few employees were engaged in conducting a survey of the pine lands in northern Greenbrier County. These crews sampled a representative percentage of the pine bearing lands at 10 chain intervals, collecting data needed to build up permanent maps indicating the location and densities of white pine stands. In this manner 13,550 acres of white pine were examined and mapped during the year, of which 9,231 acres fell within Forest Service ownership and 4,319 acres within closely intermingled private ownership.

Canker Elimination Work

In one small section of the Forest, where ribes had been permitted to grow unmolested in previous years, a considerable amount of damage due to blister rust infection was discovered. This area lies in the upper drainages of Spice Run in Greenbrier County, White Sulphur District.

In 1944, a canker elimination program was conducted over the area of heaviest infection where 1,668 trees were treated by removing 8,385 branch cankers and 4,831 trees were destroyed since they were either dead or in a dying condition. In all, 41% of the white pine on the 19 acre tract treated was infected. This demonstrates the damage which the fungus is capable of inflicting within uncontrolled areas.

Nursery Sanitation

During 1944, no nursery sanitation work was performed at the Forest Service Nursery located at Parsons, West Virginia. The control area of that nursery was subjected to an intense working in 1943, and plans have been made for additional work in 1945.

Cost of Blister Rust Work

The following table itemizes the cost of the control program on the Forest in 1944:

Table IV

Cost of Forest Service Operation and Cost
Per Acre on Rework and Survey

		Supervision:			Per Acre		
	Labor	and Operation	Total		Ribes Eradication Survey		
					Initial:	Rework	
:	:	:	:	:	:	:	:
:	6,781.33	2,680.81	9,462.14	-	1.52	0.07	:

WORK SCHEDULE FOR 1945

Approximately 50 grids remain to be resurveyed in the White Sulphur Ranger District, all of which are scheduled for completion in 1945. A small amount of eradication work remains in the Greenbrier District. In the Cheat District, white pine growth has been noted in a few localities, and plans have been made to complete all necessary surveys in that district in 1945, including the Clover Run plantation. It is estimated that approximately 4,000 acres of ribes-bearing lands remain to be reworked within the Forest. After completion of the work, it is estimated that only about 10% of the control acreage within the Forest will need additional control measures for the next several years.

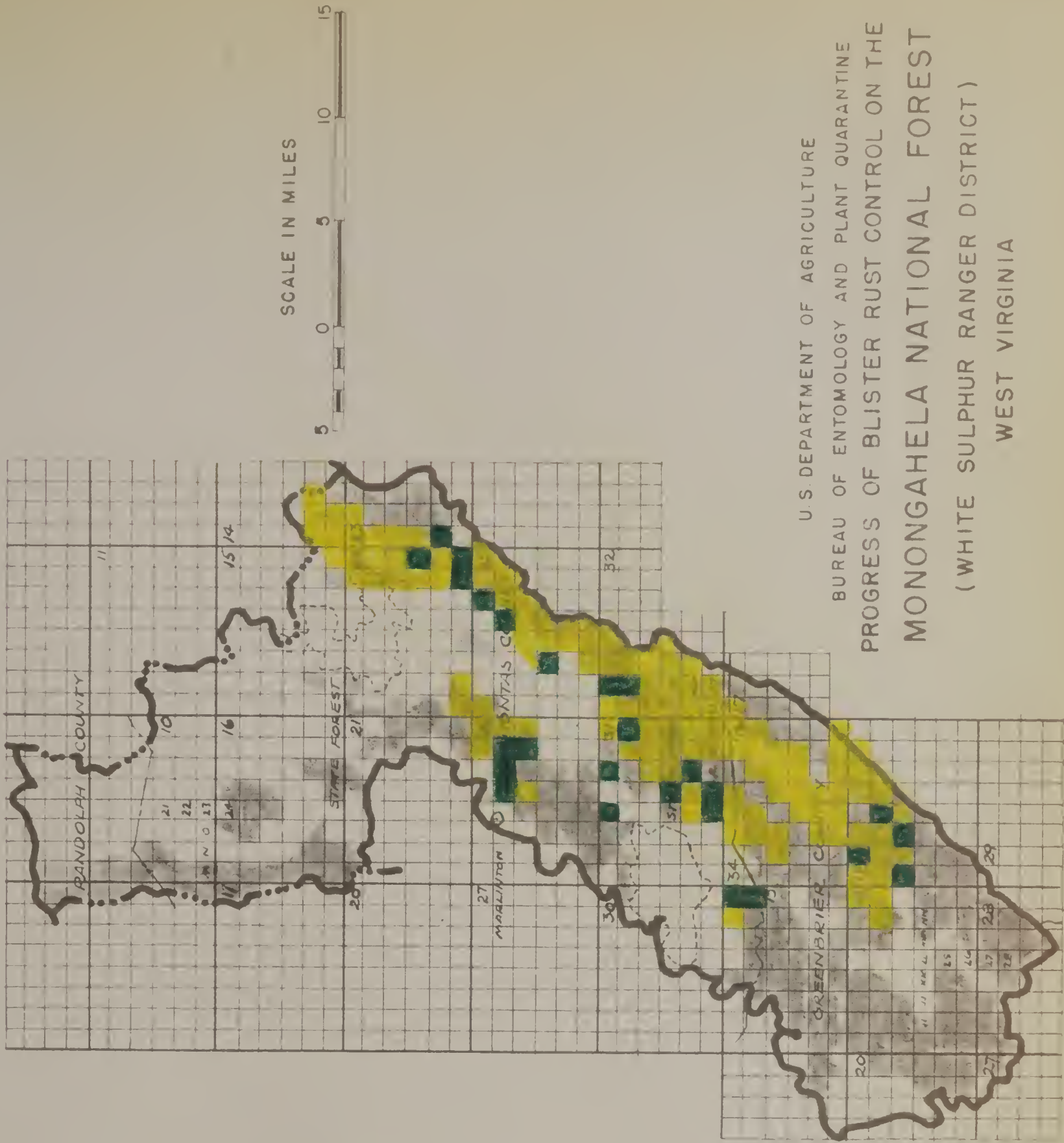
WHITE PINE CUT IN 1944

During the 1944 calendar year, a total of 368.2 M board feet of white pine was cut on the Monongahela National Forest, and sold for \$4,103.35. The average stumpage price received was \$11.14 per M board feet, according to Mr. Gordon G. Mark, in charge of the Timber Management **program** on the Forest. The volume of the cut in 1944 is about 60% greater than in 1943. The average stumpage price received is about \$1.00 per M board feet less than in 1943.

LEGEND

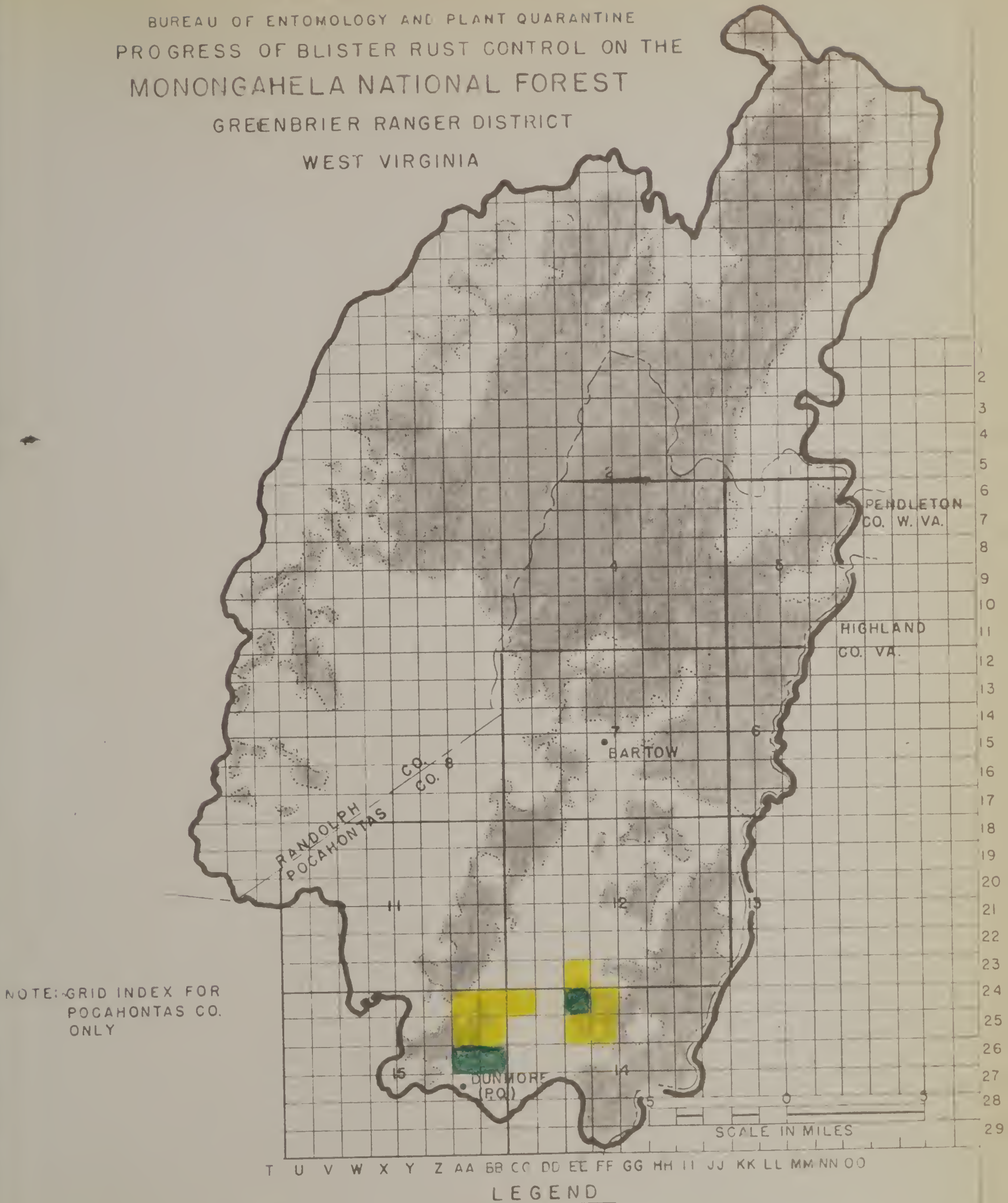
- FOREST BOUNDARY
- AREA WORKED INITIALLY
- AREA REWORKED
- AREA ON MAINTENANCE
- FEDERAL LAND

NOTE: GRID NUMBERS SHOWN
ON COUNTY INDEX MAPS.



U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
MONONGAHELA NATIONAL FOREST
(WHITE SULPHUR RANGER DISTRICT)
WEST VIRGINIA

U. S. DEPARTMENT OF AGRICULTURE
 BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
 PROGRESS OF BLISTER RUST CONTROL ON THE
 MONONGAHELA NATIONAL FOREST
 GREENBRIER RANGER DISTRICT
 WEST VIRGINIA



WHITE PINE BLISTER RUST CONTROL

IN THE

CHATAHOOCHEE NATIONAL FOREST

GEORGIA

1944

BLISTER RUST CONTROL AREA NO. 2

Ralph W. Welch - Area Leader

W. V. Zimmer - Assistant Area Leader

STATUS OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1944

Practically all of the best white pine stands in northern Georgia are found within the purchase unit boundary of the Chattahoochee National Forest. Since 1944 white pine blister rust control work has been performed on National Forest lands within the Forest under various emergency and regular Bureau of Entomology and Plant Quarantine and Forest Service programs.

During the emergency programs large acreages were covered by general reconnaissance and wild ribes were eradicated more or less where they were found by the eradication crews. No detailed maps were made during this early period and it was soon found that adequate maps were needed in order to show the extent and density of white pine as well as to more clearly tie in the association of ribes and white pine.

In 1938 a detailed mile square grid survey was started and as the survey progressed it was soon found that many of the old eradication areas would need no further attention mainly because of the distance involved between white pine and ribes-bearing areas.

In general, white pine grows best in northern Georgia between 1,500 and 2,500 feet in elevation. Wild ribes are usually found either near the upper elevation limits of white pine or far above the present limits. However, during the past few years, under adequate fire protection, it has been noticed that white pine reproduction is gradually becoming established at higher elevations so in a matter of years many of the areas surveyed a few years back should be reexamined to determine whether there is sufficient white pine to warrant the extension of the control zone to higher elevations. So far the grid survey has been completed on the Toccoa Ranger District, about half of the Blue Ridge Ranger District and a portion of the Tallulah Ranger District.

The present status of white pine blister rust control shown in Table I gives consideration to the acreage actually grid surveyed as being initially worked. The total acreage in the control area, column 2, is based on the actual grid survey plus what is estimated remaining to be completed.

Table I

Status - December 31, 1944

White Pine:	Control:	Control:	Control:	Total	Total:	Percent	Acres
In Control:	Acreage:	Acreage	Acreage:	Ribes	Man	Initial	On
Area	In	Initially:	Re-	Destroyed:	Days	Work	Mainten-
	Forest	Worked	worked			Completed:	ance
		(1)					
289,663	415,792	252,365	5,059	1,735,436	8,930	60.7	244,095

(1) Includes 244,095 acres ribes-free and 8,270 acres ribes-bearing.
Net figures used in above table.

BLISTER RUST CONTROL WORK IN 1944

White Pine Surveys

During the calendar year 1944, white pine surveys were continued, the crews working out of camps located at Rock Creek Game Refuge, Fannin County and Lake Winifield Scott in Union County. Out of a total of 43,660 acres mapped all was found to be ribes-free except 116 acres falling in four grids in the vicinity of Wolf Pen Gap in Union County. White pine was found to be of sufficient value to warrant the eradication of wild ribes on the 116 acres.

Ribes-bearing acreage which showed up on the survey as being too far from white pine was excluded from the control area. Table III gives a summary of the ribes eradication work performed on Forest Service lands in 1944. The status map on page 115 shows the location of the four grids (colored red) where ribes eradication work was performed on Forest Service lands.

Table II

Area of White Pine and Control Area Surveyed in 1944

Acres White Pine Mapped			Acres	
: 50 or more	: Under 50	:	: Control	:
: stems	: stems	: Total	: Area	:
: per acre	: per acre	:	: Mapped	:
: 18,468	: 22,923	: 41,391	: 43,660	:

Ribes Eradication Work In 1944

On the areas within the four grids worked during the year ribes were mostly found growing in steep, rocky hollows which made eradication somewhat slow and difficult. Deeply embedded roots which broke off were treated with applications of salt and borax mixture to prevent sprouting. Regular checks revealed a good, clean job of eradication. However, since the job was done rather late in the fall, another check will be run in the spring of 1945 to determine the extent of sprouting, if any.

Table III

Ribes Eradication on Forest Service Lands - 1944

: Initial :	: Total :	: Ribes :	: Man:	: Man :	: Ribes per :
: Acreage :	: Ribes-bearing :	: Acres :	: Destroyed :	: Days :	: Acres (Ribes- :
: Ribes-Free :	: Initial :	: Rework :	: Worked :	: : Per Acre :	: bearing only) :
: (1) :	: :	: :	: :	: (2) :	: (3) :
: 43,544 :	: 116 :	: - :	: 43,660 :	: 6,910 :	: 809 :
				: 0.02 :	: 59.6 :

- (1) Also blocked out were 29,940 acres on private land intermingled with Federal holdings. Not included in above total.
- (2) Man days include 237 on ribes eradication and 572 on examining and blocking out ribes free acreage.
- (3) On actual ribes eradication on the 116 acres worked, man-days per acre ran 2.04.

Labor and Supervision

Work was carried on under direct supervision of Assistant Area Leader, W. V. Zimmer, and Field Supervisor, Fred Hall. Size of crew varied from eight to ten men.

No serious labor shortage has been noted during the year, although we have had a large turnover in comparison with the small number of men employed. Quite a few have gone to various branches of the Armed Forces. Some high school students were used during the summer months and returned to school in the fall. Several of our employees worked on a seasonal or part time basis. These men returned to the farms during the planting and harvesting seasons. One of our main difficulties in securing labor is the necessity of working out of camps. Most men want to return to their homes each night and will not consider employment which keeps them away. However, our project must be operated from camps from the standpoint of staying within our mileage allotment and conserving means of transportation.

Table IV

Cost of Blister Rust Control Program on National Forest - 1944

: Labor :	: Supervision :	: Total :	: Per Acre :
: and :	: Operation :	: Ribes Eradication :	: Initial : Rework :
: (1) :	: (2) :	: :	: :
: 5,337.34 :	: 4,791.77 :	: 10,129.11 :	: 0.23 : - :

- (1) \$1,642.50 expended for supervision.
- (2) This represents the over all cost per acre in examining blocking out ribes-free acreage as well as ribes eradication.

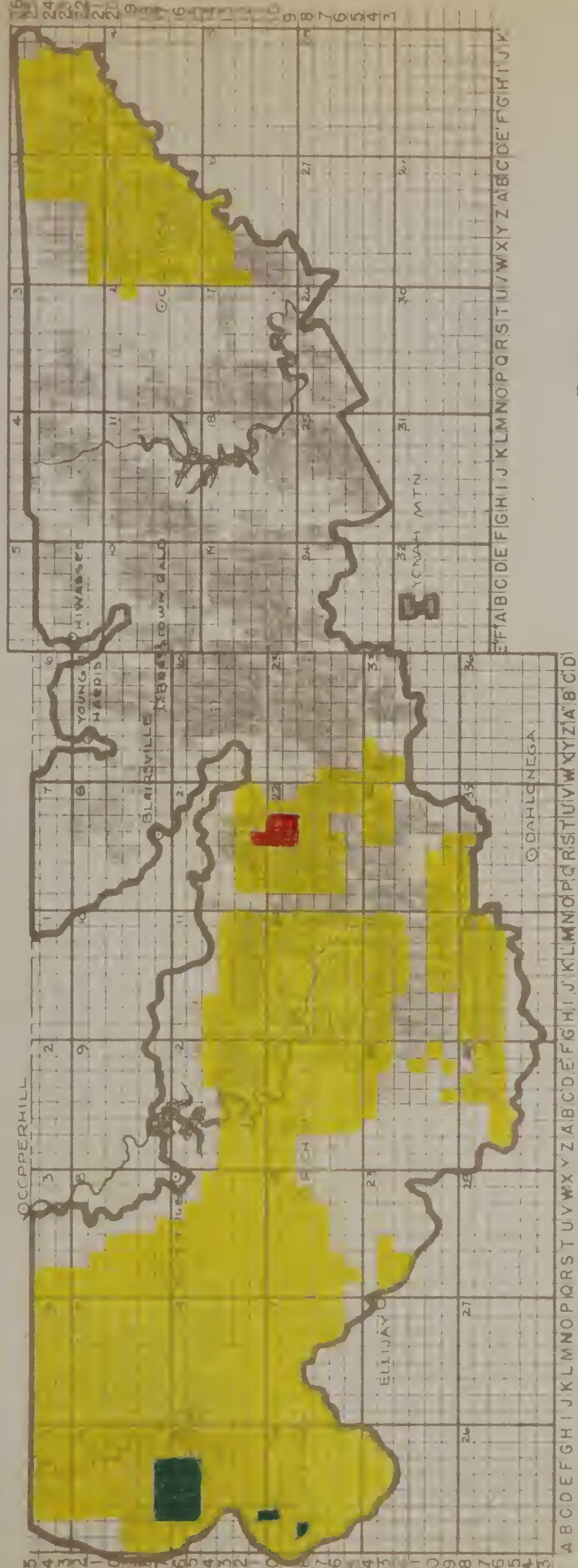
No blister rust infection has been discovered either on ribes or white pine within the State.

Recommendations for Future Work

Since the crews are now working in the vicinity of known ribes concentration a good deal of time will be spent in 1945 in relocating the old ribes-bearing areas. White pine counts as well as ribes counts will be taken to determine whether the white pine is of sufficient densities at the higher elevations to warrant a reworking of the ribes areas. No ribes eradication will be performed until the mapping is completed and definite control boundaries established. It is hoped that most of the Blue Ridge Ranger District will be completed by the end of 1945.

Besides continuing with the survey a number of areas will be post checked which were previously mapped by the grid system during the winter months.

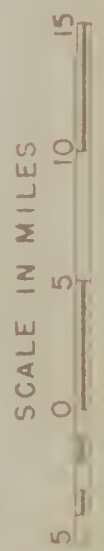
On the following page is a progress map showing the status of control on the Chattahoochee National Forest.



LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY
- AREA REWORKED
- AREA ON MAINTENANCE
- FEDERAL LAND

U.S. DEPARTMENT OF AGRICULTURE
 BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
 PROGRESS OF BLISTER RUST CONTROL ON THE
 CHATTAHOOCHEE NATIONAL FOREST
 GEORGIA



WHITE PINE BLISTER RUST CONTROL

PISGAH NATIONAL FOREST

NORTH CAROLINA

1944

BLISTER RUST CONTROL AREA 1

Henry E. Yost - Area Leader

H. B. Teague - Asst. Area Leader

STATUS OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1944

Blister rust control work was first performed on the Pisgah Forest by the ECW program in 1934 and was continued during the succeeding years by CCC, PWA and Regular Agencies. For detailed information on each program or for each year, kindly refer to the annual reports for the years of 1934 to 1943 inclusive.

All white pine growing areas in the Pisgah National Forest have been examined and surveyed, with those having native ribes (currant and gooseberry bushes) being surveyed by the grid system and given a $2\frac{1}{2}\%$ check. White pine plantations have been inspected and ribes eradicated wherever found. All native white pine areas have been worked initially with reworking performed where needed.

The last reworking in native ribes areas was begun with Forest Service Regular funds in 1943 in the French Broad District in Haywood County and was completed in Mitchell County in July of 1944.

Table I

Status of Control As of December 31, 1944

: White Pine :	Control :	Control :	Control :	Total :	Total :	Percent :	Area :
: In Control :	Acreage :	Acreage :	Acreage :	Ribes :	Man :	Initial :	On :
: Area :	In :	Initially :	Re- :	Dest- :	Days :	Work :	Mainten- :
: :	: Forest :	: Worked :	: worked :	: royed :	: :	: Completed :	: ance :
: :	: :	: (1) :	: (2) :	: :	: :	: :	: (3) :
: 79,083 :	: 153,450 :	: 153,450 :	: 3,874 :	: 608,895 :	: 12,483 :	: 100 :	: 148,841 :

(1) Includes 148,836 acres ribes-free and 4,614 acres ribes-bearing.

(2) Includes 2,499 acres second working and 1,375 acres 3rd or more workings.

(3) Acreage which is ribes-free or which has had the ribes population reduced to the point that no further working is needed for 5 to 10 years or more.

BLISTER RUST CONTROL WORK IN 1944

White Pine Survey

Survey work had been completed with the exception of 2 grids prior to 1944, and these were mapped during the early part of this year. Both survey and ribes eradication work performed in 1944 were in the Mt. Mitchell Ranger District.

It was of special interest to see the excellent white pine reproduction which is coming into areas heretofore composed of hardwoods. The young pines have an excellent chance to grow where chestnut has been killed by

the blight and with most of the dead trees being removed in accessible areas, the white pine have a good opportunity to get started. This was particularly noticeable in the Beauty Spot Gap section on the North Carolina-Tennessee line where white pine seed has been blown considerable distance from scattered seed trees thus invading and establishing themselves in previously non-pine sections. Good soil coupled with favorable moisture and other growing conditions are helping the white pines to get off to a rapid start.

An increase in number of white pines per acre was noticeable in mixed stands of white pine and hardwood, with the young pines getting a good start in most sections. Removal of slower growing, mature species for lumber is giving the white pine added chances for maturing.

Table II

White Pine and Control Area Surveyed In 1944

				Acres	Approximate	
Forest	50 or more	Under 50		Control	Grid Survey	
District	stems per	stems	Total	Area	Complete	
	acre	per acre		Mapped	(Acres)	
Mt.						
Mitchell	26	186	212	755	33,513	

Ribes Eradication Work In 1944.

Following post checking in 1943 areas designated for reworking were set up during the winter and ribes eradication work was begun with a crew of trained men in the Spring of 1944. Most of the work was in the Poplar Creek vicinity, being north of Poplar Creed and east of Shinbone Ridge, extending to the top of Unaka Mountain east to Beauty Spot Gap; and was performed under the direct supervision of Mr. John H. Dale of Bakersville. The number of workers averaged 11 men with a peak of 14 men being employed during June.

Chief ribes eradication difficulties encountered were steep, rock slopes, thick underbrush with green briars, and a few poisonous snakes. Many bushes were growing with their roots in rock crevices, or with roots twining down through masses of rocks. In such cases the broken roots were treated with even mixtures of salt and borax in doses of 4 ounces or more per bush. To speed up ribes eradication work, large bushes with roots embedded in rocks were cut off with pruning shears and the crowns treated with 3 or 4 ounce packages of salt and borax mixture. Use of the mixture has been found practical in preventing sprouting from roots, and its low cost makes it worth while as a time saver. (A large bush with deeply embedded roots may require 2 men 10 minutes to eradicate where 1 man with pruners and chemicals can do the job in 3 minutes.)

Ribes found in 1944 were relatively scattered and included seedlings, missed bushes and sprouts from roots broken off during previous working. Reproduction by seedlings was considered to be very light due principally

A study of the area lying North of the Nolichucky River and West of Shinbone Ridge showed that most of the area had never been cut over and is inaccessible at the present time. An inspection of this area was made with Mr. Gordon A. Hammond, in charge of Timber Management on the forest, and it was decided to do no work in that section until the future status of the mature timber is determined. Later, if the area is cut over and roads constructed into it, ribes eradication work will be performed to protect the excellent young white pine which is present.

Summary of Ribes Eradication in 1944

				Acreage
Control Acreage Worked				Ribes Man Remaining
Ribes	Ribes-bearing	Destroyed	Days	to be
Free	Initial	Rework	Total	worked
710	-	1,843	2,553	17,778 : 466 : 0

Post checks were made over all areas to determine whether ribes bushes were present, and ribes eradication work was performed only on those areas having ribes. Following ribes eradication work a 2.5% check was made to determine whether the quality of the eradication work was satisfactory. Results of checking in the 6 grids worked is summarized in the following table:

Summary of Checking Work In 1944

Number of Strip Acres Checked	Number Ribes Found	Total Feet Live Stem	Number Bushes Per Acre	Feet of Live Stem Per Acre
68.5	358	4,318	5.2	63

119

Table V

Cost of Blister Rust Control Program on Pisgah N.F. 1944

:	:	Supervision	:	:	Per Acre	:
:	Labor	:	and	Total	Ribes Eradication	Survey*
:	:	Operation	:	:	Initial	Rework
:	:	:	:	:	:	:
:	2,797.50	:	231.67	3,029.17	-	1.42
:	:	:	:	:	:	-

*Survey work included parts of 2 grids which were mapped by the Regular-Cooperative project in connection with work on adjoining private land at no cost to the Pisgah project.

WORK PLANS AND RECOMMENDATIONS

No work plans are scheduled for Pisgah National Forest during 1945 and 1946. An estimate will be prepared later for work in 1947 or 1948 to include checking and reworking in the French Broad and Mt. Mitchell District for work in Buncombe, Haywood, Mitchell and Yancey Counties. Work in Buncombe County will be confined to white pine plantations in the Big Ivy working circle. Under present conditions the situation is well in hand. However, land acquisition, extreme white pine reproduction and planting, or intensification of the disease in scattered white pine stands may materially alter the picture in the future. So far no blister rust has been found on white pine in the State of North Carolina.

The following pages are progress maps for the Pisgah and French Broad Mt. Mitchell and Grandfather Districts.

U.S. DEPARTMENT OF AGRICULTURE
 BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
 PROGRESS OF BLISTER RUST CONTROL ON THE
 PISGAH NATIONAL FOREST
 (FRENCH BROAD, MT. MITCHELL AND
 GRANDFATHER RANGER DISTRICTS)
 NORTH CAROLINA

LEGEND

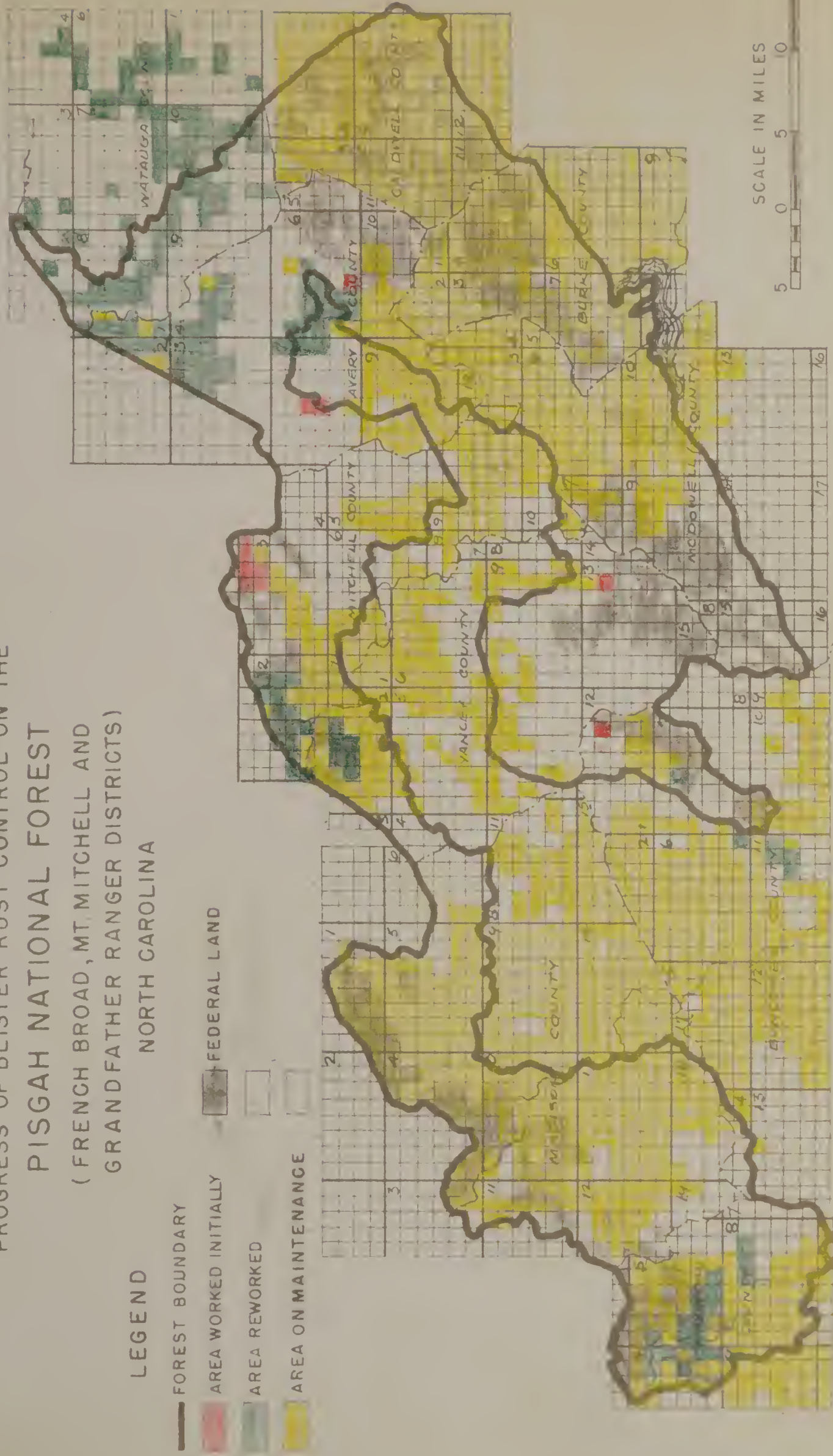
— FOREST BOUNDARY

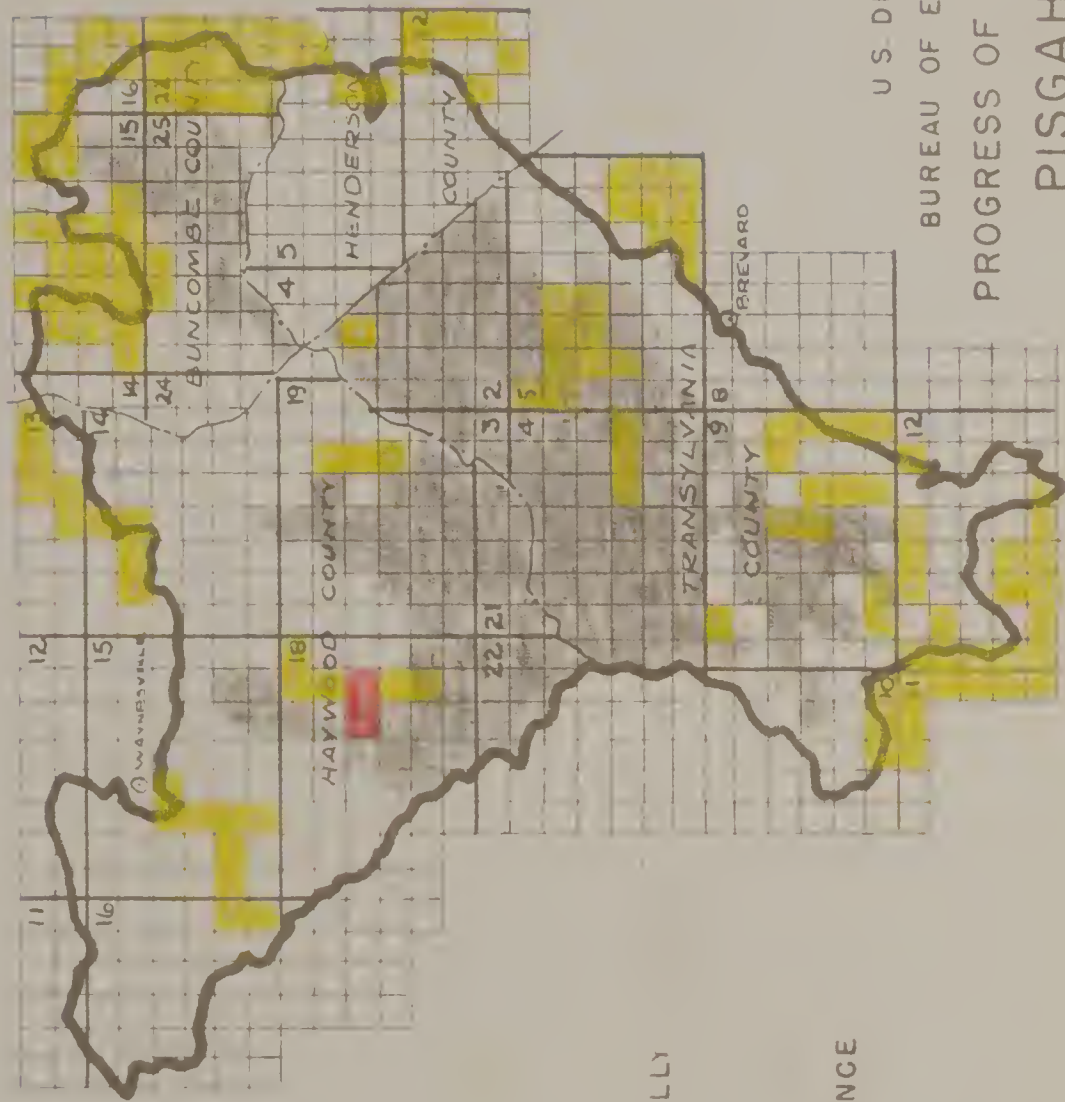
■ AREA WORKED INITIALLY

■ AREA REWORKED

■ AREA ON MAINTENANCE

■ FEDERAL LAND





LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY
- AREA REWORKED
- AREA ON MAINTENANCE
- FEDERAL LAND

SCALE IN MILES



U.S. DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

PROGRESS OF BLISTER RUST CONTROL ON THE

PISGAH NATIONAL FOREST

(PISGAH RANGER DISTRICT)

NORTH CAROLINA

WHITE PINE BLISTER RUST CONTROL
IN THE
NANTAHALA NATIONAL FOREST
NORTH CAROLINA
1944

BLISTER RUST CONTROL AREA 1

Henry E. Yost - Area Leader

H. B. Teague - Asst. Area Leader

Initial Blister Rust Control work was completed in the native white pine areas of the Nantahala National Forest in 1938 under the direction of Agent H. A. Whitman. Since then work has been confined to white pine plantations which were inspected by Assistant Area Leader Teague in 1944.

Ribes eradication work included cultivated bushes growing on or near the Forest with occasional locations of abandoned bushes found at old house sites. A few native wild ribes locations were found, mostly at high elevations. One area of wild bushes was found at Cullasaja Falls at an elevation of 2,500 feet. This area was not worked due to the hazards involved and the high cost which it would incur. Also white pine within the area was rather scattered when the original survey was made.

All mapping of white pine areas was done by spotting them in on county road maps, and with the rapid increases in white pine and changing forest conditions those maps do not now reflect a true picture of white pine conditions in the Nantahala National Forest at this time. White pine has increased in density as well as having spread to new areas; and in many sections has seeded in at higher elevations, particularly in areas thinned out by the death of the chestnuts. Being adapted to the climate and soil of the forest, white pine is making good growth and promises to be one of the major timber producing trees wherever it is found in the Forest. The largest area of white pine is located in southwest Jackson County and extends from Jackson County, South Carolina line northward past Highlands along the Cullasaja River watershed to the Cullasaja Falls vicinity in Macon County. Other smaller areas are found in Cherokee and Graham Counties. White pine plantations have been established by the Nantahala National Forest in Cherokee, Clay, Graham, Jackson and Macon Counties, and in the 7 plantations inspected in 1944 it was making excellent growth. Very little weevil damage was seen, survival was good, no ribes were found, and in some of the plantations hardwood mixtures were beginning to come in.

Although the majority of timber in the Nantahala National Forest is hardwood, the white pine areas are of great value, both for their potential lumber production and for their aesthetic value. The Nantahala National Forest is in a nationally popular tourist resort section and the white pine section of Macon and Jackson Counties is normally visited by thousands of tourists annually, and some of the most popular picnic areas in the Forest are surrounded by white pines.

Table I

Status of Ribes Eradication As of December 31, 1944

White Pine:	Control:	Control:	Control:	Total:	Total:	Percent:	Acres On:
In Control:	Acreage:	Acreage:	Acreage:	Ribes:	Man:	Initial:	Mainten-:
Area:	In:	Initially:	Re-:	Des-:	Days:	Work:	ance:
:	Forest:	Worked:	worked:	troyed:	:	Completed:	:
:	:	:	:	(1):	:	:	(2):
23,771	47,246	47,246	-	393	494	100	47,246

(1) All cultivated ribes

(2) Acreage which is ribes-free or which has had the ribes population reduced to the point that no further working is needed for 10 years or more following last working.

BLISTER RUST CONTROL WORK IN 1944

Control work in 1944 consisted of inspecting white pine planting sites by Assistant Area Leader H. B. Teague. Seven plantations were initially inspected in Cherokee, Graham, Jackson and Macon Counties with no ribes being found. A summary of the work performed is tabulated below:

Table II

Summary of Ribes Eradication Work In 1944

Initial:	Control:	Acreage:	Worked:	:	:	*	Acreage:
Acreage:	Ribes-bearing:	:	:	Ribes:	Man:	Remaining:	:
Ribes-:	Initial:	Rework:	Total:	Destroyed:	Days:	to be:	:
Free:	:	:	:	:	:	worked:	:
:	:	:	:	:	:	:	:
710	-	-	710	-	-	-	-

*Worked by Leader

WORK SCHEDULE FOR 1945

It is recommended that a grid survey be made of the white pine growing section of the Nantahala National Forest in southwest Jackson County and in the southeastern part of Macon County including the Cullasaja River section north to the vicinity of Cullasaja Falls. Ribes are present on the higher slopes of some of the mountains, and are found at 2,500 feet at Cullasaja Falls; and in recent years white pine has spread upward on the mountain slopes. The survey would be a combination mapping and post checking project to determine whether there are areas containing more than 50 white pines per acre that are near native ribes.

This work could be performed in 1945, or could be postponed if more urgent work is needed elsewhere in the Region.

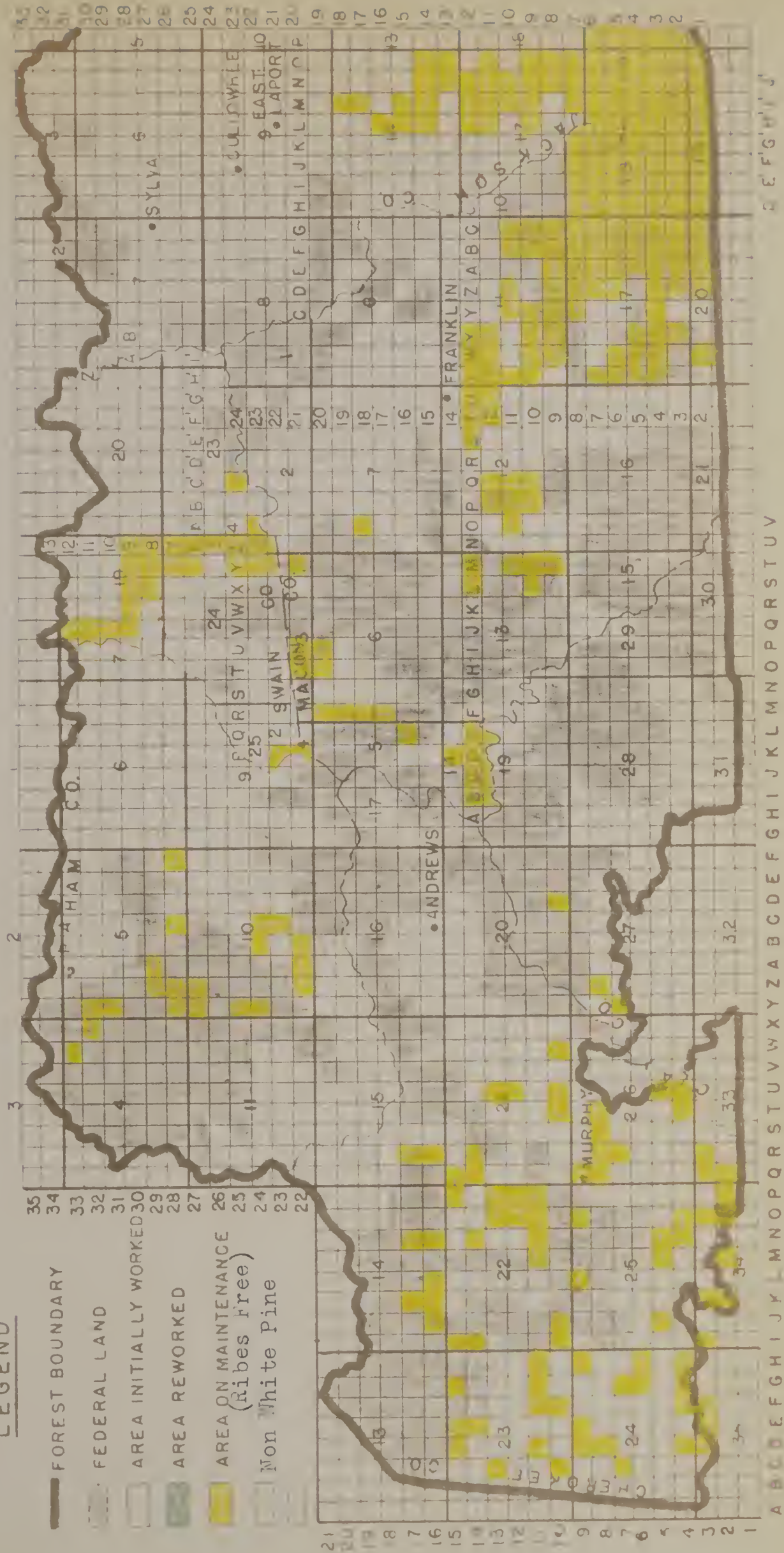
In the spring of 1944 a field trip was made through the best white pine section of the Nantahala Forest by Mr. F. M. Cossitt of the Forest Service Regional Headquarters in Atlanta, Georgia, J. Curtis Ball, Assistant Regional Leader of Blister Rust Control and W. V. Zimmer, State Leader of Georgia. Mr. Cossitt was quite impressed with the white pine in the Cullasaja pine area and was much in favor in having a complete grid survey made in the near future. It is apparent that white pine has increased in both density and area since the original "spot" survey was made. Because Mr. Zimmer is located closer to this area than any other person in the blister rust area it has been agreed upon that he will have direct charge of supervising the survey work on this Forest.

On the following page is a progress map showing the status of blister rust control on the Nantahala Forest.

U S DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
NANTAHALA NATIONAL FOREST
NORTH CAROLINA

LEGEND

- FOREST BOUNDARY
- FEDERAL LAND
- AREA INITIALLY WORKED
- AREA REWORKED
- AREA ON MAINTENANCE
(Ribes free)
- Non White Pine



5 0 5 10
SCALE IN MILES

WHITE PINE BLISTER RUST CONTROL

IN THE

CHEROKEE NATIONAL FOREST

TENNESSEE

1944

By

Ralph W. Welch, Area Leader, Blister Rust Area No. 2

STATUS OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1944

Blister rust control work was begun on a small scale in the Cherokee National Forest as early as 1933, using CCC labor. The bulk of the initial eradication program, however, was accomplished a few years later by utilizing Federal and State-sponsored WPA projects. After discontinuation of the WPA projects, initial work remained incomplete in Polk and Monroe Counties and in 1943 and 1944, Forest Service funds were allotted to complete the initial work and to perform a second working where needed within the Forest. In 1943, the work in Polk County was completed. Likewise, the work in Monroe County was completed in 1944, and a small amount of second working was completed in Unicoi County.

Control records indicate that a total of 250,378 acres of white pine have been mapped and protected in the Forest. This acreage is incorporated within 484,572 acres of control area (pine plus 900 foot protective strip). Less than 1% of the control area acreage bore ribes. However, 1,966,590 ribes bushes were destroyed on the ribes-bearing land 3,235 acres. The majority of the ribes on first working were destroyed in Unicoi, Johnson and Sullivan Counties. In addition to the first working, 1,061 acres have been reworked once, and 10,395 ribes destroyed.

As of December 31, 1944, about 99% of the control acreage within the Forest is on a maintenance basis and for the next few years the work will be more limited in scope. Occasional post checks and resurveys will be made in ribes areas to determine the need of further eradication work and to determine if white pine is spreading to acreage outside the present control limits.

Table I

Status of Blister Rust Control Work as of December 31, 1944

: White Pine:	: Control :	: Control :	: Control:	: Total :	: Total:	: Percent :	: Acres :
: In Control:	: Acreage :	: Acreage :	: Acreage:	: Ribes :	: Man :	: Initial :	: On :
: Area :	: In :	: Initially:	: Re- :	: Destroyed:	: Days :	: Work :	: Mainten- :
: :	: Forest :	: Worked :	: worked :	: :	: :	: Completed:	: ance :
: :	: :	: :	: :	: :	: :	: :	: :
: 250,378 :	: 484,572 :	: 484,572 :	: 1,061 :	: 1,976,985:	: 8,445 :	: 100% :	: 481,800 :

BLISTER RUST CONTROL WORK IN 1944

The majority of the work performed in the current year was pine survey, rather than ribes eradication. The survey revealed that white pine and ribes were not closely associated over the vast majority of the control acreage examined in 1944, which was located, for the most part, in Monroe County. A total of 44,780 acres of white pine and 142,052 acres of control area were examined and mapped during the year, the former figure being incorporated with the latter. The survey was accomplished with 652 man-days labor.

Table II

White Pine and Control Area Surveyed in 1944

(1) Acres White Pine Mapped			Acres	Acreage of	
50 or more	Under 50	Total	Control Survey Completed		
stems per acre	Stems per acre		Area	Thru 1944	
			Mapped		
19,220	25,560	44,780	142,052	484,572	(100%)

(1) All pine survey work in 1944 was in Monroe County.

RIBES ERADICATION WORK IN 1944

In all of Monroe County over which surveys were conducted, only one locality had ribes and white pine growing in association. This area of 230 acres is located on Sycamore Creek, a tributary of the Tellico River in the Tellico Plains Ranger District. A total of 12,400 wild ribes were destroyed on the area by the Forest Service ribes eradication crew. Delayed checks were conducted over the area several weeks after completion of the eradication project, and all indications pointed to a satisfactory job of eradication.

In Unicoi County, a second working was performed over 805 acres of ribes-bearing land which had been initially worked several years before, and 8,180 ribes were destroyed in these areas all of which are located in the Unaka Division.

The Monroe County work was performed from a blister rust camp located on the Tellico River above Tellico Plains. The laborers required for the project were housed in trailers furnished by the Forest Service. In mid-summer the camp was eliminated when the work in Monroe County was completed. Since the project in Unicoi County required such a short time for completion, no camp was established.

Table III

Summary of Ribes Eradication 1944

Control:		*	Ribes	Man	Acreage	
Acreage:	Control	Acreage Worked	Destroyed	Days	Remaining	
Ribes					to be	
Free	Initial	Rework	Total		Worked	
141,822	230	805	1,035	20,744	96	0

*Ribes-bearing acreage

Table IV

Cost of Blister Rust Control Work 1944

:	:	Supervision:	:	Per Acre			:
:	Labor	:	and	:	Total	:	Ribes Eradication : Survey :
:	:	Operation	:	:	:	:	Initial : Rework :
:	:	:	:	:	:	:	:
:	4,741.27	:	1,117.74	:	5,859.01	:	1.21 : 0.17 : 0.03 :

The extensive use of Tennessee Valley Authority quadrangle maps greatly reduced the cost per acre on survey work.

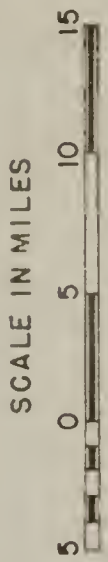
WHITE PINE

White pine grows exceptionally well along the mountain slopes of eastern Tennessee from Johnson County south through Polk County at elevations ranging from 1,500 feet to 2,500 feet. Since wild ribes are generally found at higher elevations than this we find that the bulk of the native white pine stands are naturally free of wild ribes. In Johnson County and certain sections of Carter County white pine is often found growing in pure stands. Further south, however, white pine is more generally associated with hardwoods and to some extent with yellow pines. With continued fire protection one can expect white pine to eventually extend its range if present observations are any criterion.

FUTURE PLANS

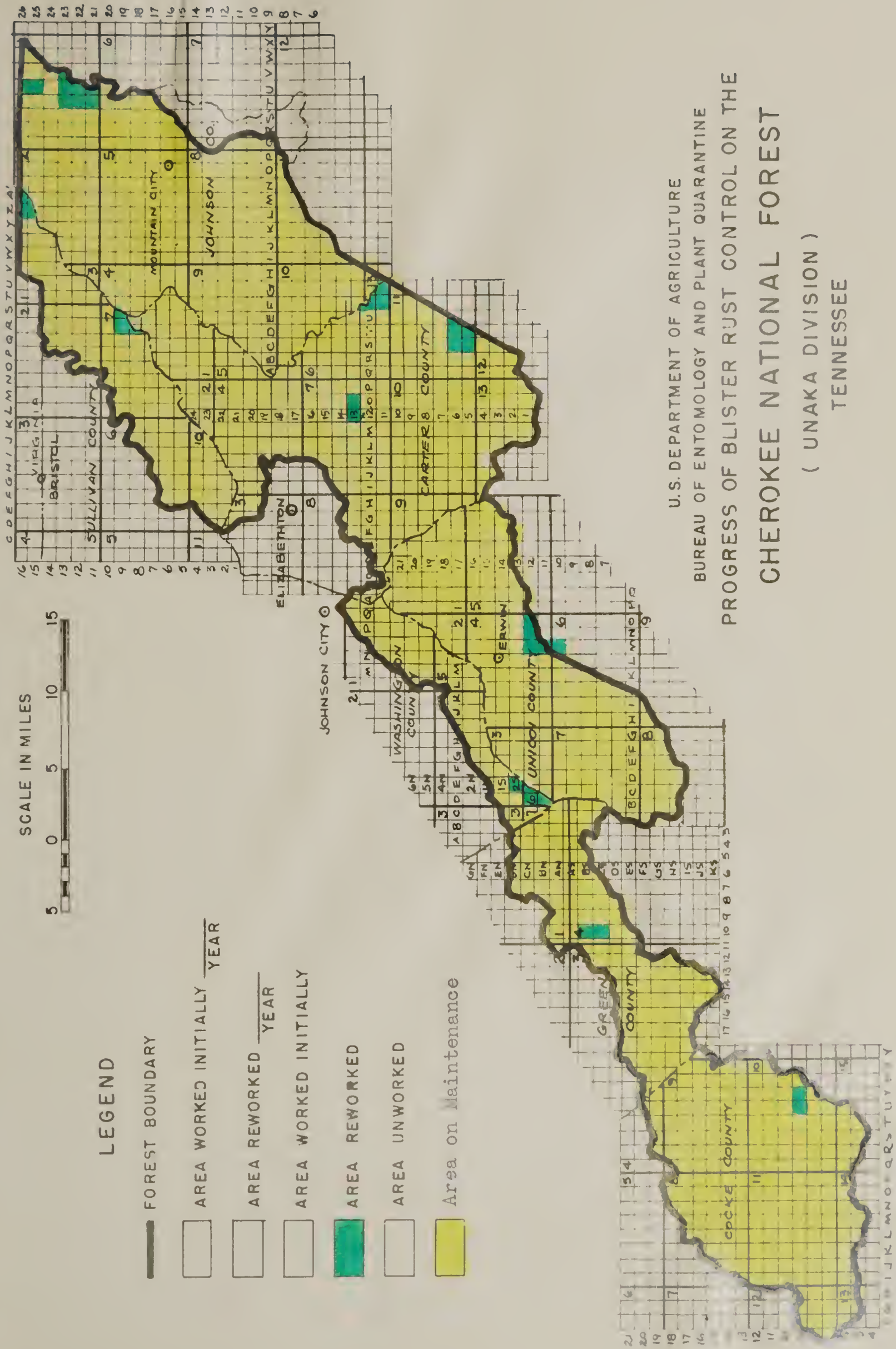
Due to the fact that all initial work has now been completed in the Forest, as well as a considerable amount of the second working, no additional work is planned on the Cherokee National Forest after the end of the present fiscal year until 1946 or 1947, when post checking will be performed over some of the ribes areas which were worked in earlier years. Future eradication work is contingent upon the number and size of ribes bushes found on post check but it is not expected that a great deal of ribes eradication work will be needed on the Forest for several years.

The following pages are maps showing status of control on the Unaka and Cherokee Divisions.



LEGEND

- FOREST BOUNDARY
- AREA WORKED INITIALLY YEAR
- AREA REWORKED YEAR
- AREA WORKED INITIALLY
- AREA REWORKED
- AREA UNWORKED
- Area on Maintenance



U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
CHEROKEE NATIONAL FOREST
(UNAKA DIVISION)
TENNESSEE

SCALE IN MILES



LEGEND

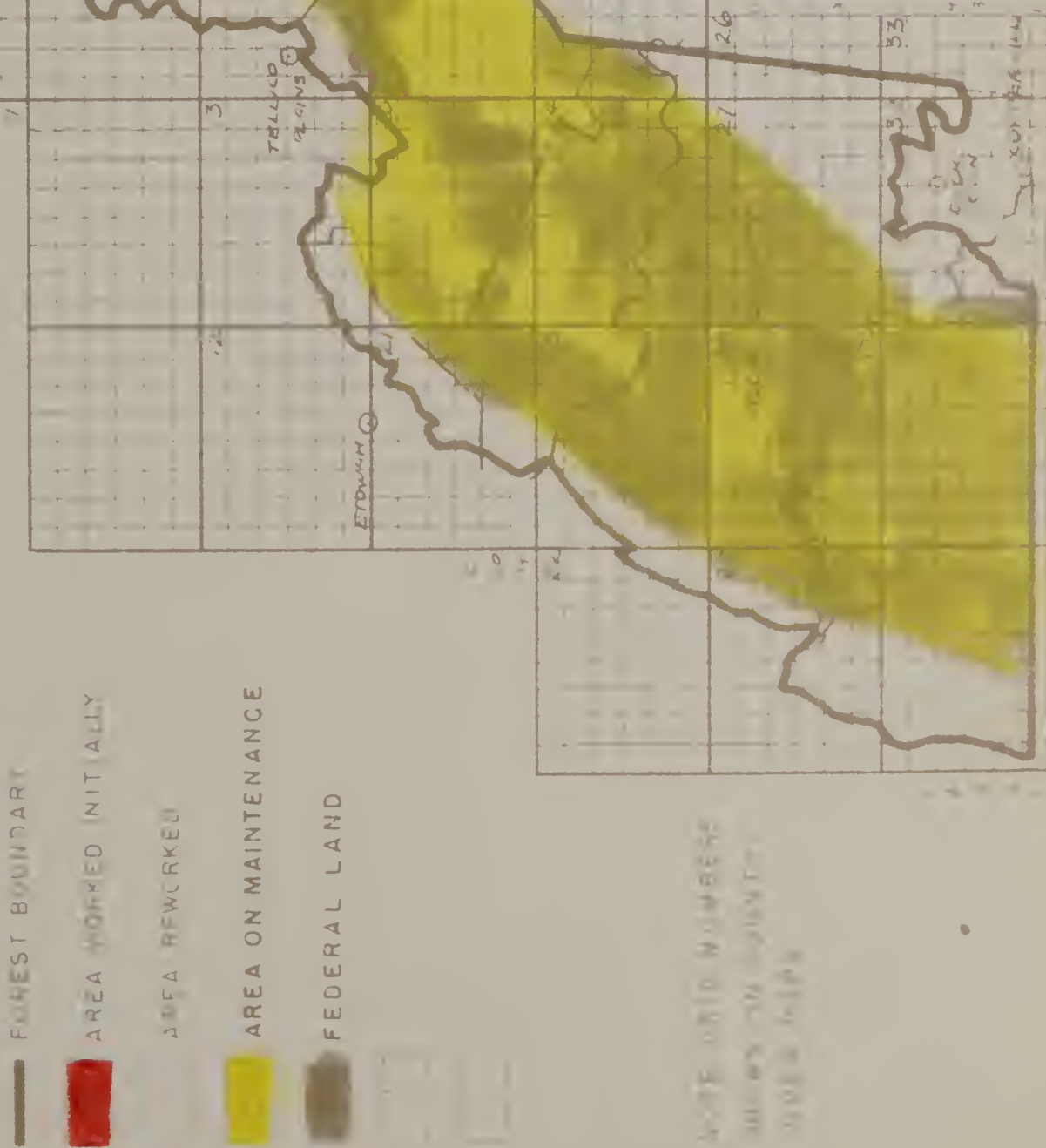
FOREST BOUNDARY

AREA WORKED INITIALLY

AREA REWORKED

AREA ON MAINTENANCE

FEDERAL LAND



U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
CHEROKEE NATIONAL FOREST
(CHEROKEE DIVISION)
TENNESSEE

PART V

Work Project BLR-5

Detailed Reports on Blister Rust Control on
National Park Lands - 1944

By

Henry E. Yost, P-3, Area Leader, Area No. 1

H. B. Teague, P-2, Assistant Area Leader

Ralph W. Welch, P-3, Area Leader, Area No. 2

WHITE PINE BLISTER RUST CONTROL
IN THE
SHENANDOAH NATIONAL PARK
1944

By

H.E. Yost - Area Leader-Blister Rust Control-Area No. 1

Reviewed By R. B. Moore, Forester,
Shenandoah National Park

INTRODUCTION

The white pine blister rust control situation on the Shenandoah National Park could well be described as the most difficult in the Region. The highest pine values from the Park standpoint are those located along the Skyline Drive, which is on the crest of the Blue Ridge Mountains. In this part of the Blue Ridge Range, wild ribes are found in abundance at the highest elevations and tend to disappear at about the 2,000 foot level. White pine is occasionally found at all but the very highest elevations on the Park, which means that along most of the Skyline Drive where white pine is present wild ribes are also found in varying quantities. The blister rust had become established in the Park before any control work was begun. The particular meteorological and topographical features of much of the Park are very favorable for the spread of the rust. Through ribes eradication and canker elimination work the disease has been generally brought under control, however, more work per acre will be required in the future, as in the past, than for any other unit in the Region. At the lower elevations which are around the outer limits of the Park, a large amount of good white pine is found in areas which are for the most part ribes-free. These sections of the Park are undeveloped and, therefore, are of lower priority than the developed areas.

The control work in the Shenandoah National Park continued during the year much the same as in the past, i.e. the Park Service is doing the work with the Bureau of Entomology and Plant Quarantine lending such aid as is possible and necessary. Excellent progress is being made, considering the present manpower shortage, particularly in men of the supervisory level.

A considerable increase in both the density and acreage of white pine was observed in some places on the Park.

The following table gives the status of the control work as of December 31, 1944:

Table I

Status As Of December 31, 1944

White Pine:	Control:	Control:	Control:	Total	Total:	Percent	Acres	:
In Control:	Acreage:	Acreage:	Acreage:	Ribes	Man	Initial	On	:
Area	In The	Initially:	Re-	Destroyed:	Days	Work	Maintenance:	:
:	Park	Worked	worked	:	:	Completed:	:	:
:	:	:	:	:	:	:	:	:
:	3,517	15,452	13,745	8,344	2,618,239	29,821	89	1,580

BLISTER RUST CONTROL WORK IN 1944

All work during the year was carried on by CPS labor working from Camp 45 at Pinnacles. Except during the fire season, Mr. Roy Sullivan was employed as checker in charge of the work. He was promoted to the position of ranger about May 1944, since which time the CPS men continued survey under such supervision as the Park Forester had time to do. The quality and quantity of the work of the CPS men was satisfactory. Continued turnover of personnel due to transfers and detached service assignments makes it necessary to train many inexperienced men. The disadvantages of this is offset to some extent by the generally high level of intelligence and education of the enrollees.

Table II

Areas of White Pine and Control Area Surveyed in 1944

Acres of W. P. Mapped			Control	Approximate
Over 50	Under 50		Area	Grid Survey
Stems	Stems	Total	Mapped	Acres
Per Acre	Per Acre			Completed
494	-	494	2,147	10,000

The above includes only the surveyed white pine areas which were retained in the control area.

RIBES ERADICATION WORK IN 1944

Table III

Ribes Eradication In 1944

Area and Area Number	Acres:	Ribes Control Acreage Worked:			Ribes Destroyed	Days Worked	Man Remaining
		Free	Initial	Rework			
				Total			to be
Rapedan Camp 28:	-	180	-	180	8,543	73	-
Big Meadows 4:	-	-	368	368	1,337	30	-
Hawksbill 1:	-	-	237	237	10,845	138	-
Spitler 8:	-	-	97	97	3,650	98	-
Rapedan Camp 28:	-	-	70	70	214	12	-
TOTAL	-	180	772	952	24,589	375	1,707

*Initial acreage only for that part of the Park surveyed to date

Ribes eradication work was all reworking except where it was found necessary to extend the old control zones to protect natural white pine reproduction or to correct errors in previous surveys. Ribes were found at the rate of 21.8 bushes per acre on subsequent work this year, as compared with 47.5 per acre on initial work. Liberal use was made of a mixture of equal parts of salt and borax on ribes roots or crowns which could not be readily removed. Approximately 100 pounds of this chemical was used, usually at the rate of $\frac{1}{4}$ pound per bush. Experienced on other projects, as well as controlled tests, prove it to be effective as well as harmless to animal life and nearby plants.

All of the control area covered this year was checked to determine the amount of ribes missed by the crew. All of the work was found to be satisfactory. The entire area was given a 5% strip check most of which was performed by Mr. Sullivan. In addition 800 acres of control area was checked to determine the rate of ribes regeneration and the need of reworking. Most of this was by CPS labor.

COSTS OF THE BLISTER RUST CONTROL PROGRAM ON THE SHENANDOAH NATIONAL PARK

The cost of ribes eradication work on a per acre basis was among the lowest of all the programs in the State. This is due, to a slight extent, to value of \$0.45 per hour placed on CPS labor, and also because the ribes per acre was not high. The lowest wage rate paid on any of the other projects is \$0.50 plus overtime pay per hour with semi-skilled and skilled men receiving more. The man-days spent per acre compares very favorably with the other projects.

The cost per acre for survey, however, was higher than most projects because all of this work on the Park was based on a 5% coverage as compared to a $2\frac{1}{2}\%$ coverage in most other cases; also much time was spent in training new men.

The following table shows the costs of the work:

Table IV

Cost of Blister Rust Control in 1944

	Supervision :		Total	Per Acre		
	Labor	and Operation		Ribes Eradication:	Survey	
				Initial:	Rework	
	2,109.60	730.00	2,839.60	1.69	1.63	0.31

WORK SCHEDULE FOR 1945

It is planned during 1945 to continue and if possible complete the resurvey of all the pine areas. Many of these areas were established when

abundant labor was available and in some cases without much regard to the previous or probable come-back of ribs. Civilian Public Service employees will be used on Blister Rust Control work in the Park during 1945. It is hoped that a qualified checker can be obtained in the near future to supervise and handle all the checking work on the Park. The checker will be employed by the Park Service to be employed the year round, seven months on blister rust control and five months on fire control.

WHITE PINE BLISTER RUST CONTROL

ON

THE BLUE RIDGE PARKWAY - 1944

BLISTER RUST CONTROL AREA 1

H. E. Yost - Area Leader *

H. B. Teague - Asst. Area Leader

*This report was reviewed by Wilbur L. Savage,
Forester and Sam P. Weems, Supt. of the
Blue Ridge Parkway

STATUS OF BLISTER RUST CONTROL AS OF DECEMBER 31, 1944

Table I

:	White Pine:	Control:	Control:	Control:	Total:	Total:	Percent:	Acres:	:
State:	In Control:	Acreage:	Acreage:	Acreage:	Ribes:	Man:	Initial:	On:	:
:	Area*	:	Initially:	Re-	Des-	Days:	Work:	Mainten-:	:
:	(Acres):	:	Worked:	worked:	troyed:	:	Completed:	ance:	:
Va.:	630	:2,581	: 2,581	: -	:16,936:	458	: 100	: 1,544	:
N.C.:	1,779	:4,388	: 4,388	: -	: 61:	10	: 100	: 4,378	:
TOTAL:	2,409	:6,969	: 6,969	: -	:16,997:	468	: 100	: 5,922	:

*This represents only that part of the total control area which is surveyed. For the entire Parkway, including those parts not yet graded, probably some 65% of the survey is completed. Of the total control acreage worked 1,047 acres are ribes-bearing and 5,922 acres ribes-free.

BLISTER RUST CONTROL WORK IN 1944

White Pine Survey

Blister rust control work was carried on in Virginia and North Carolina. The survey work was carried on at Wilkinson Gap, the Peaks of Otter and Rocky Knob in Virginia; Linville River and vicinity was surveyed in North Carolina. All survey was by the grid method. At Wilkinson Gap and the Peaks of Otter, Mr. Obbie F. Simmons of the Bureau of Entomology and Plant Quarantine, made the survey using CPS labor. The Rocky Knob survey was made by Mr. Elbert L. Dove of the Bureau of Entomology and Plant Quarantine and William C. Howell of the Park Service. Ranger Dillon also gave valuable assistance in the work. The survey will be completed by January 31, 1945 for practically all of the white pine believed worth protecting north of Adney Gap. The survey work in North Carolina was carried on by the State Cooperative crews in conjunction with work on privately owned lands adjacent to the Parkway. All costs were paid from the Cooperative Funds. This survey covered largely the outer limits of the Linville River area. Other observations indicate that good white pine reproduction is found over most of this area. Because of the narrowness of the right of way, the survey on the remainder of the Parkway, except for the recreation areas, will be made in conjunction with this work by other agencies. The following table gives a resume of the survey work during 1944.

Table II

Acres of White Pine and Control Area Surveyed in 1944

State	Acres of W. P. Mapped			Acres in Control Area Mapped	Approximate Percent Grid Survey Completed
	50 or more stems per acre	Under 50 stems per acre	Total		
Va.	113	62	175	685	50
N. C.	207	294	501	640	80
TOTAL	320	356	676	1,325	65

In addition there were over 1,400 acres mapped in Virginia on which the wild ribes were so abundant that control work was not considered feasible at this time.

Ribes Eradication

Ribes eradication work in 1944 was confined largely, except for 18 cultivated bushes pulled in North Carolina, to Virginia. All eradication of wild ribes was by CPS labor at Wilkinson Gap, Section 1-J, Station 440 to Section 1-K, Station 30. The wild ribes were not exceedingly heavy at Wilkinson Gap but much of the area was covered with dense brush, which resulted in considerable more than an average amount of time per acre being used. The check on this work, however, indicated a very thorough job. A large part of the control area was heavily burned in 1943, therefore, careful checks and possibly early rework will be necessary. In addition, a recheck resulted in the destruction of 143 cultivated ribes by the Park rangers.

The following table gives a resume of the ribes eradication work performed in 1944:

Table III

Ribes Eradication - 1944

State	Ribes-Free Acres	Acres Worked			Ribes Destroyed	Man Days
		Initial	Rework	Total		
Va.	505	180	-	180	1,957	134
TOTAL	505	180	-	180	1,957*	134

*Includes 142 cultivated ribes. In North Carolina (not shown in table) 18 cultivated ribes were pulled on and adjacent to the Parkway.

The checking on the control area at Wilkinson Gap showed 0.9 bushes per acre with 6.5 feet of ribes live stem per acre left by the crew. Most of this live stem was found in one large bush near the outer edge of the control

zone.

COST OF THE PROGRAM

The following table shows the expenditure of funds for this work:

Table IV

Cost of Blister Rust Control Program - 1944

		Agency	Labor	Cost Per Acre		
		and	and	Ribes Eradication:	Survey	
		Program	Supervisor	Initial	Rework	
:	:	Park Ser. CPS:	(1)728.00	3.09	-	0.84
:	Va.	Bureau	(2)112.12	-	-	0.71
:	:	:	:	:	:	:
:	TOTAL	:	849.12	3.09	-	0.78

(1)CPS cost based on 208 man-days at \$3.50 per day.

(2)Includes \$76.00 paid the Bureau of Entomology and Plant Quarantine for labor on reimbursement basis.

The above does not include the time or expenses of regular administrative or supervisory personnel such as foresters or rangers. A large part of the training and supervision on survey, as well as on ribes eradication and checking, was by such men.

The costs per acre on survey are based on the total acres covered by the survey crews rather than that part of the area surveyed which is retained as control area. The men paid from Bureau Regular Funds covered 1,580 acres, of which 505 acres was retained in the control area, while the CPS men surveyed 1,440 acres of which 153 acres was for the present incorporated into the control area. All of the 1944 surveyed area which is to be protected is shown in the table on page 141.

WHITE PINE AND RIBES OCCURRENCE

The loss of white pine along the Parkway from white pine blister rust to date is for all practical purpose nil. Since the control work consists primarily of preventing damage, the degree of hazard or the probability of damage is important. From this standpoint the Parkway may be regarded as follows: (The following subdivisions are indicated on the map at the end of this report.

1. From Rockfish Gap to Highway U. S. 60 very good white pine is found between Tye River Gap and Clarks Gap. Wild ribes are relatively abundant near most of this pine. Rust is found in several places adjacent

to the Parkway property. Survey and initial eradication was completed in 1943. A regular check is scheduled for the Spring of 1945.

2. From Highway U. S. 60 to Petites Gap white pine is present but no ribes of major importance have been found or are believed to be present.

3. From Petites Gap to the end of construction north of Highway U. S. 460 inclusive, very good white pine is present in a few places and is protected by work done in 1943 and 1944. Wild ribes are generally abundant, particularly on the Peaks of Otter and Apple Orchard. It is at present considered impracticable to protect any but the best pine or the pine in areas of light ribes concentration. Survey is completed except for some 300 or 400 acres on the east slope of Sharp Top. All eradication work is completed except for unsurveyed portions and some white pine which may be reconsidered at a later date. No rust has been found on white pine on or near the Parkway in these sections.

4. From Adney Gap to Deep Gap, excellent white pine is generally found over most of these sections. No wild ribes are known to be present except over about 150 acres in Rock Castle Creek Gorge in Rocky Knob. A detailed survey was completed on those parts of the Rocky Knob area having the best white pine. Any necessity of eradicating wild ribes will depend upon final development plans for the area and the rate of white pine reproduction hereafter. Blister rust was found on wild ribes but none has been found on pine to date. These entire sections were checked by the rangers for cultivated ribes and eradication will be completed in the Spring of 1945. A small amount of checking will be required for some years to come.

5. From Deep Gap to Blowing Rock excellent white pine is found with reproduction increasing the density of the stands. Initial working has been completed with cultivated and wild ribes being removed from most sections. Frequent checking will be necessary over this section, when grading has been completed, in order to locate and eradicate the remaining bushes. Blister rust was found on ribes one-half mile west of the Parkway on private land in 1941 near Bamboo and although the area has been inspected annually no rust has been found on white pine.

6. From Blowing Rock to Grandmother Mountain, white pine is generally scattered to absent with ribes fairly abundant.

7. From Grandmother Mountain to Little Switzerland white pine is present with no wild ribes known in the area. Initial working has been completed with rechecks made at the old home sites and gardens. Ribes with blister rust infection were found and eradicated near Gillespie Gap in 1941. Only one white pine was within 900 ft. of the bushes and no rust has been found on the white pine to date.

8. From Little Switzerland to Bull Gap, white pine is generally absent and ribes are abundant through the Mt. Mitchell and Craggy Gardens area to Bull Gap.

9. From Bull Gap to the French Broad River white pine is abundant beginning on the lower slopes near Oteen. Native ribes were eradicated initially on the slopes of Elk Mountain west of Bull Gap in 1939 and this area should be post checked after grading is completed.

From Oteen west to the river, checking for cultivated ribes only will be necessary. Initial working has been completed with most of the area having been checked one or more times. Part of this section extends through the historic white pine plantations made by the late George W. Vanderbilt.

10. West of the French Broad River, ribes are generally abundant through the Mt. Pisgah and the Balsam Mountains sections with white pine absent.

WORK SCHEDULE FOR 1945

The only survey scheduled for 1945 is the same 300 or 400 acres previously mentioned on the east side of Sharp Top Mountain. Plans are made to assign, on a reimbursement basis, one of the Bureau of Entomology and Plant Quarantine foremen to do this work with CPS labor during January 1945. If sufficient funds and personnel are available, some survey work may be done at Rocky Knob or Bluff Park.

Plans are completed for the Park Service to employ a competent man to work with the rangers in checking for the destroying cultivated ribes, beginning at the North Carolina line and working north. This work will be begun as soon as the leaves appear on ribes plants, about April 5, and continue until completed or until other foliage begins to obscure the small ribes bushes. This same man will then make a regular check on the 1943 work at Tye River Gap and Irish Gap. A general examination, or possibly a formal check, will be made of the burned portion of the control area at Wilkinson Gap. Some eradication of wild ribes may be carried on at Sharp Top, depending on the results of the survey scheduled for January 1945.

UNITED STATES
DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, Secretary

NATIONAL PARK SERVICE
NEWTON B. DRURY, Director

BLUE RIDGE PARKWAY
(Virginia-North Carolina)

The Blue Ridge Parkway is an elongated park with a scenic motorway being built expressly for the tourist, threading the picturesque mountains between Shenandoah National Park, Virginia, and Great Smoky Mountains National Park, North Carolina and Tennessee. The parkway, first of its type and scale planned as a single unit, will be 485 miles in length and have an average elevation of 3,000 feet above sea level. More than 360 miles of motorway, free from sharp curves and steep grades, will have been completed or be in various stages of construction during 1941, while development of complementing recreational facilities will go forward in numerous wayside parks.

LOCATION AND EXTENT OF FINISHED PARKWAY

Approximately 140 miles of the parkway, as shown on the accompanying map, will be available for use during 1941. This stretch between Adney Gap, Va., and Deep Gap, N. C., is conveniently connected at temporary terminal points with primary State highways; thus a continuous passage over first-class pavements is possible. The parkway is not maintained for winter travel between November 15 and April 15. The map shows the nearness of the completed sections to major north-south travel routes in the eastern United States. The famous Skyline Drive, 105-mile scenic highway in the Shenandoah National Park, is open to use its entire distance from Front Royal to Rock Fish Gap, Va.

WHAT TO DO

Motoring, Hiking, and Picnicking. The Blue Ridge Parkway affords an unusual opportunity to view the natural beauty of a country heretofore virtually inaccessible--a country of bold panoramas, wild forest and exceptionally beautiful flora. Numerous parking overlooks provide safe points from which to view at leisure the country below. For the continuous length of the parkway these varying roadside pictures are protected by a park-owned right-of-way averaging 1,000 feet in width, free from billboards and other increments of the usual commercial road. Use of the parkway is restricted to passenger vehicles.

The flowering season in the Blue Ridge extends continuously from early May well into July, breaking first with the shadblow, followed by the dogwood, redbud, and flame azaleas, which are especially fine in this area. During June the mountain laurel and rhododendron are at their best. In October the forests become aflame with color.

Areas of outstanding scenic interest along the parkway, varying from 500 to 10,000 acres in extent, have been reserved, where the motorist may take foot trails to the more remote and unspoiled beauty spots. Four of these recreation areas, including trails and picnic areas, comfort stations, and drinking water, will be available during 1941 -- Smart View and Rocky Knob in Virginia and Cumberland Knob and The Bluffs in North Carolina. At The Bluffs and Rocky Knob trailer and tent camping areas are available.

Fishing. There is mountain trout fishing in the parkway vicinity. State licenses are required.

WHERE TO STAY

Accommodations in cities and some of the smaller communities along the parkway vary from the finest resort and tourist hotels to modest cabin facilities. Lodges and overnight cabins within the recreation areas are not expected to be completed during 1941.

WHERE TO DINE

Because parkway concession facilities will not be completed during 1941, it is suggested that each day's travel be planned from each stopover point and that picnic lunches be taken along for noonday meals.

MOTOR SERVICE

Until parkway motor service stations are completed, it is suggested that the tourist carefully watch his gasoline and oil gauges. Motor service is available nearby on most of the major highways crossing the parkway.

ADMINISTRATION

The National Park Service office in charge is that of the Acting Superintendent, Shenandoah Life Insurance Building, Roanoke, Va., to which inquiries may be addressed.

The Blue Ridge Parkway is being developed under the supervision of the Public Roads Administration, in cooperation with the National Park Service. The States of Virginia and North Carolina are acquiring the necessary parkway lands through their respective Highway Commissions.

Please Observe the Following Regulations While on the Blue Ridge Parkway:

It is unlawful to disturb flowers, shrubs, or trees, to mar or deface signs or buildings.

Commercial vehicles are prohibited on the parkway drive.

Speed zone signs are posted. Drive carefully.

Hunting within the parkway boundaries is prohibited. Streams closed to fishing are

posted. State fishing licenses are required. State laws are in force.

Picnicking and camping are limited to designated areas where fireplaces are provided.

Be careful with campfires, cigarettes, and pipes. Do not leave a fire unattended.

March 1941

View from Cumberland Knob Park, North Carolina.



BLUE RIDGE
PARKWAY

1941

WHITE PINE BLISTER RUST CONTROL
IN THE
GREAT SMOKY MOUNTAINS NATIONAL PARK
1944

By

Ralph W. Welch, Area Leader, Area No. 2

H. B. Teague, Asst. Area Leader, Area No. 1

STATUS OF BLISTER RUST CONTROL WORK AS OF DECEMBER 31, 1944

The first working of the Park in Tennessee was completed in 1942 and no blister rust control work was considered necessary in 1944. Fortunately, wild ribes and white pine have not been found growing in close association within the Park in Tennessee, and therefore no serious control problem exists. However, if pine reproduction should gradually spread to some of the higher elevations of the Park, an eradication program might sometime become necessary in the future. It is recommended that general reconnaissance work might be effected in the early fifties, and conclusions drawn at that time as to the necessity of conducting a systematic resurvey and check of the pine areas in the Park.

All white pine areas on the North Carolina side of the Park have been worked initially and the ribes-bearing areas in the Cataloochee section of Haywood County have been reworked sufficiently. Post and regular checks made in 1943 prior to and following ribes eradication by CPS crews showed that there was considerably less than the maximum of 25 feet of ribes live stem per acre.

In the Tennessee Smokeys 90 percent of the white pine is located in Blount County, and the remaining 10 percent in Sevier County. Exceptionally fine white pine stands are located at Cades Cove in Bount County.

Most of the white pine on the North Carolina side is located in the Cataloochee and Big Creek watersheds of Haywood County and in the Deep Creek, Forney Creek, and Hazel Creek sections of Swain County. Grid surveys have been completed over all of the areas except Forney Creek and Hazel Creek, both of which have only a comparatively small amount of white pine. In the Cataloochee section young white pine reproduction is making excellent growth and gradually the area is becoming more extensive. A permanent grid survey system was laid out in this section with reference location markers set along roads to mark grid line crossings and distances to the nearest grid corner, this makes it exceedingly easy to reestablish control for future ribes eradication work.

Table I

Status as of December 31, 1944.

:	White	Control:	Control:	Control:	Total:	Total:	Percent	:	Acres	:
:State	Pine	In:	Acreage:	Acreage	Acreage:	Ribes:	Man	:	Initial	:
:	Control:	In	Initially:	Re-	Des-	Days	Work	:	Maintenance	:
:	Area	Park	Worked	worked	troyed:	Completed:	(1)	:		:
: N. C.	: 9,975	: 22,727	: 22,727	: 461	: 105,309	: 2,177	: 100	:	: 22,200	:
: Tenn.	: 45,522	: 76,708	: 76,708	: -	: (1)137	: 471	: 100	:	: 76,708	:
:	:	:	:	:	:	:	:	:	:	:
: TOTAL	: 55,497	: 99,435	: 99,435	: 461	: 105,446	: 2,648	: 100	:	: 98,908	:

(1) All Cultivated

(2) Acreage which will not need further examination for 10 years

BLISTER RUST CONTROL WORK IN 1944

Blister rust control work on the North Carolina side of the Park in 1944 consisted of a grid survey of the white pine area in the Deep Creek area. Two men under the direction of Mr. Wilbur L. Savage mapped 13 grids having some excellent white pine with good reproduction. The best individual stand of white pine along Deep Creek is at the Bryson Place which has a good stocking of large trees which have spread seed over much of the surrounding area. Reproduction is coming in rapidly, both in the old fields and in areas where the overstory was thinned by the death of the chestnuts.

Ribes are abundant on the extreme headwaters of Deep Creek, as is the case on most of the streams in the Park, but only one small patch of wild gooseberry bushes was found within the white pine areas, this being northwest of the junction of Deep Creek and Nettle Creek at an elevation of about 3,200 feet. The upper limit of white pine in Deep Creek is approximately 3,300 feet, but the elevation of the watershed continues to rise to over 5,000 feet.

Table II

Areas of White Pine and Control Area Surveyed in 1944*

Acres White Pine Mapped				Acres of:		Approximate Grid	
State	50 or more	Under 50	Total	Control	Survey Completed		
	stems	stems		Area	(acres)		
	per acre	per acre		Mapped			
					(Out of a total		
N. C.	732	969	1,701	4,100	19,132	of 22,727)	

*All 1944 work in North Carolina

There was no ribes eradication work performed on the North Carolina side of the Park in 1944. No data is available on the survey costs.

No work is scheduled for 1945 in Tennessee. Possibly some survey work will be done in the Deep Creek Section of North Carolina, although this could be postponed if necessary. A study and field examination of the situation on the Park is planned in 1945 and possibly a long range plan of work will be formulated.

Excellent cooperation has been maintained between the Park Service officers and the Bureau of Entomology and Plant Quarantine. Mr. Wilbur R. Savage, Park Forester has shown a keen interest in the blister rust program on the Park and has been most helpful in coordinating the work with the over all protection plan in the Park.

On the recommendation of Park Service officials all future blister rust control work on the Great Smoky Mountains National Park will be under the Technical Direction of Mr. H. E. Yost, Area Leader for Area No. 1 and Assistant Area Leader H. B. Teague. This will coordinate the work under one authority for both the North Carolina and Tennessee sides of the Park instead of two as has been done in the past.

Report of
WHITE PINE BLISTER RUST CONTROL
NORTH CENTRAL REGION, 1944

by

Henry N. Putnam
Senior Pathologist

SLIPPER HOVE CONTROL. HONEY CUSTARD. HONEY, 1944

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Summary of Blister Rust Control Program, December 31, 1944

North Central Region

Blister Rust Conditions

White pine blister rust continued to intensify and to spread from established infection centers throughout the North Central Region in 1944. Intensification of the rust is pronounced in unprotected white pine areas in the northern sections of the three Lake States, especially in northeastern Minnesota. The outstanding discovery in 1944 was the finding of well established natural pine infection for the first time in Allamakee, Clayton, Delaware, Howard and Winnebago Counties in northeastern Iowa. This marks a distinct southward extension of the rust on pines. Pine infection was reported for the first time also in Ionia and Gladwin Counties, Michigan; Stevens and Clearwater Counties, Minnesota; and Crawford and Green Lake Counties, Wisconsin.

Ribes infection was reported initially in 1944 from nine counties in Iowa; and one in Minnesota. A winter scouting trip in Ohio and Indiana failed to disclose new infections, either on pines or ribes, except one ribes infection spot in a county previously known to contain ribes infection.

Weather conditions, with frequent rains and low summer temperatures, were generally favorable for rust development throughout the Region, except in Indiana and Ohio, where a protracted drought apparently inhibited rust development.

White Pine

During 1944 a considerable amount of preeradication survey and post-check was performed. At the end of the year there were 1,137,227 acres of white pine in the Region listed as worth protection costs, smaller by 16,127 acres the figure reported at the end of 1943. While there were new pine areas added there were more than offset by the dropping from the records of planting sites and areas with insufficient pine values. In Ohio alone 17,351 acres of white pine planting site were taken out of the permanent records. As these areas are planted to white pine they will again be included in the total control problem. The value of white pine in this Region was conservatively estimated in 1942 to be approximately \$100,000,000. In terms of employment in industries dependent upon the harvest and manufacture of products of white pine, this figure would be several times larger.

Local Control, 1944

During 1944 local control was accomplished with funds from the following sources: State and Private, Regular funds including 3101 and 3103, Forest Service 3104 and Indian Service 3107; Indian Tribal; and a small amount of Civilian Public Service funds. Control work shown following performed in the Region in 1944 was materially greater than in 1943.

Working	Acres R. P. Protected	Acres Worked	Ribes Destroyed	Man-Days Used
Initial	21,927	49,404	1,288,642	7,579
Second	34,470	56,294	1,551,829	10,557
Third and Subsequent	1,620	4,230	117,273	1,405
Total	57,997	109,928	2,957,744	19,541

Status of Control

The status of control at the end of 1944 is shown for the Region in the following table:

Ownership Class	Total Control Problem Net Acres		Net Control Area			
	White Pine	Control Area	Acres		Percent	
			Initially Worked	On Main- tenance	Initially Worked	On Main- tenance
Forest Service	192,701	415,183	272,177	103,671	65.9	25.1
Indian Service	50,456	97,425	79,737	8,379	81.8	8.6
Nat. Park Service	15	120	120	-	100.0	-
Gov-Fed. Public	280,559	733,915	607,023	176,087	62.7	24.0
Private	613,496	2,745,051	1,915,190	567,078	66.1	13.6
Total	1,037,217	3,991,694	2,774,207	857,235	69.2	21.7

Nursery Sanitation

Of the 83 nurseries around which ribes-free zones have been established, 43 have ceased to produce white pine planting stock in commercial quantities, and their protective zones have been abandoned. Ribes-free zones are maintained around the remaining 40 nurseries. Control has been established around these nurseries, and examination for ribes every two or three years is sufficient. During 1944, nursery sanitation was performed around one private nursery in Michigan; one Forest Service nursery in Minnesota; and three State Nurseries in Wisconsin. A total of 903 ribes was removed from 1,699 acres of sanitation zones, at a cost of 55 man-days.

Control Area Permits

In order to prevent the replanting of cultivated ribes within control areas, the states of Illinois, Michigan, Minnesota, Ohio, and Wisconsin, under state authority, have designated control areas into which ribes may not be shipped without state approval. During 1944, there were 5,797 applications for ribes shipping permits requested, of which 5,746 were approved, and 51 rejected.

Cultivated Black Currant Elimination

No systematic cultivated black currant elimination program was performed in 1944. Outstanding was the destruction of 3,485 old bushes in one location in Berrien County, Michigan. This work was performed by a state crew engaged in destruction of diseased vineyards. A mechanical device drawn by a tractor facilitated the uprooting of the bushes.

Future Control Work

Necessarily, with the rust increasing as it is, and with the labor shortage, unavoidable loss of white pines will result. By directing efforts toward protection of the best stands of young white pine most immediately in need of the work in 1945 we hope to keep the losses to a minimum.

Nursery Sanitation

Sanitation zones around all but one of the eight nurseries growing white pine are being maintained in a ribes-free condition. No sanitation work was done in 1964, because none was needed.

Control Area Permits

During 1964, there were 57 control area permits issued for the shipment of ribes, and no requests rejected.

Cultivated Black Currant Elimination

No systematic black currant elimination program has been in effect. To date, in connection with local control, nursery sanitation and scouting, a total of 761 bushes has been destroyed.

Future Control Program

A few pine areas remain to be mapped. Major emphasis will continue to be placed in protection of white pine stands, to the limit of funds and labor available, in order to place on maintenance as quickly as possible all valuable white pine stands.

Summary of Blister Rust Control, 1964

Indiana

The State Leader of work in Ohio and Indiana transferred in March, 1964 to other work. No control operations were carried on in Indiana during 1964, other than a brief scouting trip by the Area Leader, and some work on the Indiana permanent records.

Blister Rust Conditions

No additional blister rust infection was found in 1964. To date, no pine infection has been found, other than on imported white pine in 1910, which was promptly destroyed.

White Pine

White pine occurs chiefly in plantations, except for a few acres of natural stands in the northwest corner of the State. White pine continues to be extensively planted, for reforestation by individuals, coal companies, and the State. There are 6,655 acres of white pine listed for protection. The value of white pine in the State was estimated in 1962 to be \$1,515,001.

Local Control

During 1944, local control was performed with Bureau-State funds on state-owned parks and forests, and with Indian Service 3107 funds on the Sae-Pee Indian Reservation. Work in 1944 was as follows:

Working	Ownership Class	Acres W.P. Protected	Acres Worked	Elms Destroyed	Man-Days Used
Initial	Indian Service	35	204	10,402	111
	Non-Fed. Public	56	352	34,114	205
	Sub-total	91	556	44,516	316
Second Working	Indian Service	10	205	9,952	59
	Non-Fed. Public	35	243	34,713	200
	Sub-total	45	448	44,665	259
Third Working	Non-Fed. Public	28	146	22,000	125
Grand Total		164	1,050	111,181	600

Status of Control, December 31, 1944

Ownership Class	Total Control Problem		Sae Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Main-tenance	Initially Worked	On Main-tenance
Indian Service	45	500	500	-	100.0	-
Non-Fed. Public	463	3,211	2,624	3	81.7	0.1
Private	4,792	56,289	30,671	11,263	54.5	20.2
Total	5,240	60,000	33,195	14,266	54.2	20.3

Nursery Sanitation

Elm-free sanitation zones are maintained around seven of the nine nurseries originally protected. No nursery sanitation was performed in 1944 because it was unnecessary at this time.

Cultivated Black Current Elimination

In connection with local control and other field work, 229 cultivated black current bushes in 52 plantings were destroyed. To date, 7,171 bushes have been removed from white pine growing counties.

Future Control Program

As in 1944, control work in 1945 will be largely confined to protection of pines on state-owned lands in northwestern Iowa. The protection of privately-owned shelterbelts is suspended until after the war.

Status of Control, December 31, 1944

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Main- tenance	Initially Worked	On Main- tenance
Forest Service	58,905	445,018	135,203	73,870	93.2	50.9
Nat. Park Service	15	120	120	-	100.0	-
Gov-Fed. Public	444,547	341,374	308,966	109,116	90.5	32.0
Private	246,592	854,583	690,445	139,608	80.8	16.3
Total	750,059	1,640,595	1,124,734	322,594	85.2	29.2

Ribbery Sanitation

Ribbery-free sanitation zones are being maintained around nine of the 25 white pine producing nurseries originally protected. Most of these nine nurseries are in good condition with respect to ribbery, and require only checking every two or three years. In 1944, the sanitation zone around one nursery was checked.

Control Area Permits

During 1944, there were 1,700 requests for ribbery shipping permits, of which 1,673 were granted and 27 rejected.

Cultivated Black Currant Elimination

No systematic campaign was conducted. However, 3,485 old bushes in one planting in Harrison County were destroyed by a state crew engaged in removal of diseased vineyards. A mechanical digger drawn by a truck facilitated the work. To date, 447,485 cultivated black currant bushes have been destroyed in the State.

Sankey Pruning

During 1944, 10 were infected white pines in protected stands, 510 sankeys were removed from 428 trees. To date, 94,837 sankeys have been pruned from 38,545 trees, and 291 fatally infected trees cut down.

Future Control Program

As in 1944, work planned for 1945 will include the protection of only those best young stands of white pine most immediately in need of the work, in order to make most effective use of the limited manpower available. Because of the intensification of the rust in the north, major attention will be given to young stands there.

Status of Control, December 31, 1944

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Per cent	
	White Pine	Control Area	Initially Worked	On Main- tenance	Initially Worked	On Main- tenance
Forest Service	110,741	195,732	72,647	23,087	37.0	11.8
Indian Service	19,225	29,446	28,403	7,836	96.5	26.6
Non-Fed. Public	59,496	126,217	72,077	18,690	57.7	14.8
Private	88,731	277,387	207,485	36,078	74.8	13.8
Total	278,193	628,782	380,212	85,691	60.8	11.0

Nursery Sanitation

Of the 17 white pine producing nurseries originally protected, pine-free sanitation zones have been maintained around nine of them. Sanitation work was performed around one nursery in 1944.

Control Area Permits

The northeastern part of the State has been declared a control area by state authority. Ribes bushes may be shipped into this portion only under state permit. During 1944, there were 260 ribes planting permits requested, 294 granted, and 6 refused.

Cultivated Black Currant Elimination

No cultivated black currant bushes were destroyed in 1944. To date, 23,308 bushes have been removed from white pine growing counties.

Canker Pruning

During 1944, to save white pines in protected stands, 1,574 cankers were removed from 1,150 white pines. To date, 31,363 cankers have been pruned from 10,302 trees.

Future Control Program

As in 1944 the work in 1945 will be confined to the Superior and Chippewa National Forests, and State and Indian Service lands in northeastern Minnesota. Because of the rapid intensification of the rust, and the limited manpower available, it is unavoidable that young white pines growing on large areas will be killed by blister rust before they can be protected. To make most effective use of manpower available, work will be concentrated as in 1944, on the largest and best areas of young white pines most immediately in need of the work.

Summary of Blister Rust Control, 1944

Ohio

The State Leader for Ohio and Indiana transferred to March, 1944 to other work. No control operations were carried on in Ohio during 1944, other than a brief surveying trip by the Area Leader, and considerable work on the Ohio permanent records.

Blister Rust Conditions

No infection on white pines or ribes was reported initially from surveys during 1944. To date, rust on white pines has been found in 17, and on ribes in 64 counties, chiefly in the northern part of the State. It is believed the protracted dry, hot spell in the summer of 1944 inhibited rust development.

White Pine

Over 85 percent of the 16,562 acres of white pine listed for protection in Ohio is planted. By removing from the permanent records acres of planting sites, there was a reduction of 17.3% acres under the 15,715 acres shown in the 1943 report. As these planting sites are planted to white pine, they will again be included in the control program. Based largely on current experience, it was estimated in 1942 that white pine in Ohio was valued at \$4,175,121.

Status of Control, December 31, 1944

Ownership Class	Total Control Problem Net Acres		Net Control Area			
	White Pine	Control Area	Acres		Percent	
			Initially Worked	On Main- tenance	Initially Worked	On Main- tenance
Forest Service	520	4,341	1,875	1,875	49.3	43.3
Semi-Pub. Public	5,837	51,518	39,430	11,988	72.4	22.8
Private	12,005	52,183	111,656	50,511	61.7	41.8
Total	18,362	108,042	152,961	64,374	83.9	59.9

Survey Sanitation

Ribes-free sanitation zones are being maintained around four of the 15 nurseries originally protected. No work was done in 1944.

Control Area Permits

During 1944, there were 2,205 requests for ribes snipping permits. Of these 2,190 were granted and 15 rejected.

Cultivated Black Currant Elimination

The status of this project in 1944 was the same as at the end of 1943, namely, that 73,117 cultivated black currant bushes had been destroyed.

Future Control Program

No general resumption of control work is planned until after the war, or until labor becomes more available. In the meantime white pine plantings are being recorded in the permanent records, so that data will be up to date when the program is resumed.

Summary of Blister Rust Control, 1944

Wisconsin

Blister Rust Conditions

Rust on pines was found for the first time in Crawford and Green Lake Counties. To date, pine infection has been reported from 58 of the 71 counties in the State, and ribes infection from all of them. Weather conditions were favorable for rust development in 1944, and ribes infection was heavy. There is a rapid rate of rust intensification in unprotected pine stands.

White Pine

As a result of surveys performed in 1944, the 382,478 acres of valuable white pine listed for protection at the end of 1944 was an increase of 5,918 acres of white pine over the figure reported in 1943. This increase was on Indian Service and private lands, and was chiefly composed of natural white pine reproduction. Commercial value of Wisconsin's white pine was estimated at \$36,906,615 in 1942.

Local Control, 1944

Ribes eradication in 1944 was performed on National Forests using 3304 funds; on Indian Reservations using 3107 funds, supplemented by Tribal funds on the Menominee Indian Reservation; and on state and private lands using Bureau-State funds. As in 1943, Indian women were used successfully in ribes eradication crews. For the first time in Wisconsin white women made up eradication crews on the Chequamegon National Forest. As ribes eradication laborers, women are particularly good in areas not supporting large bushes. Work done in 1944 is shown following:

Ownership	Ownership Class	Acres W.P. Established	Acres Marked	Acres Destroyed	Acres Days Used
First	Forest Service	956	1,126	66,696	197
	Indian Service	1,566	2,681	307,365	5,178
	Sec-Fed. Public	807	2,058	63,616	966
	Private	11,361	18,535	113,166	1,062
	Subtotal	14,690	24,300	249,837	7,443
Second	Forest Service	1,685	3,088	89,703	1,685
	Indian Service	766	1,082	93,813	1,308
	Sec-Fed. Public	2,766	7,377	10,157	283
	Private	15,866	39,031	68,638	688
	Subtotal	21,082	50,584	162,311	3,964
Third	Forest Service	766	1,082	76,188	283
Grand Totals		36,538	74,972	4,168,056	11,495

Index of Control, December 31, 1964

Ownership Class	Total Control Problem		Net Control Area			
	Net Acres		Acres		Percent	
	White Pine	Control Area	Initially Worked	On Balance	Initially Worked	On Balance
Forest Service	50,466	17,661	63,882	1,839	68.7	7.2
Indian Service	51,183	67,175	80,836	323	79.3	0.8
Sec-Fed. Public	67,038	183,894	161,273	29,966	66.0	13.9
Private	255,798	1,047,126	678,860	95,560	91.1	9.1
Total	944,285	1,305,856	984,851	127,788	86.9	5.1

Nursery Excitation

White pine excitation areas are being maintained around 11 of the 17 white pine producing nurseries in the State. These 11 nurseries are now in a sanitary condition with respect to ribes, and require only periodic weeding to maintain ribes-free conditions. During 1964, excitation areas around three abandoned nurseries were checked. A total of 719 ribes was removed from 1,025 acres of excitation area, at a cost of 53 man-days.

Control Area Permits

White pine areas protected against the rust, and covered as such under State authority are declared to be control areas. No ribes may be shipped within the State without State Approval. During 1964, there were 1,375 applications made, of which 1,572 were approved and three rejected.

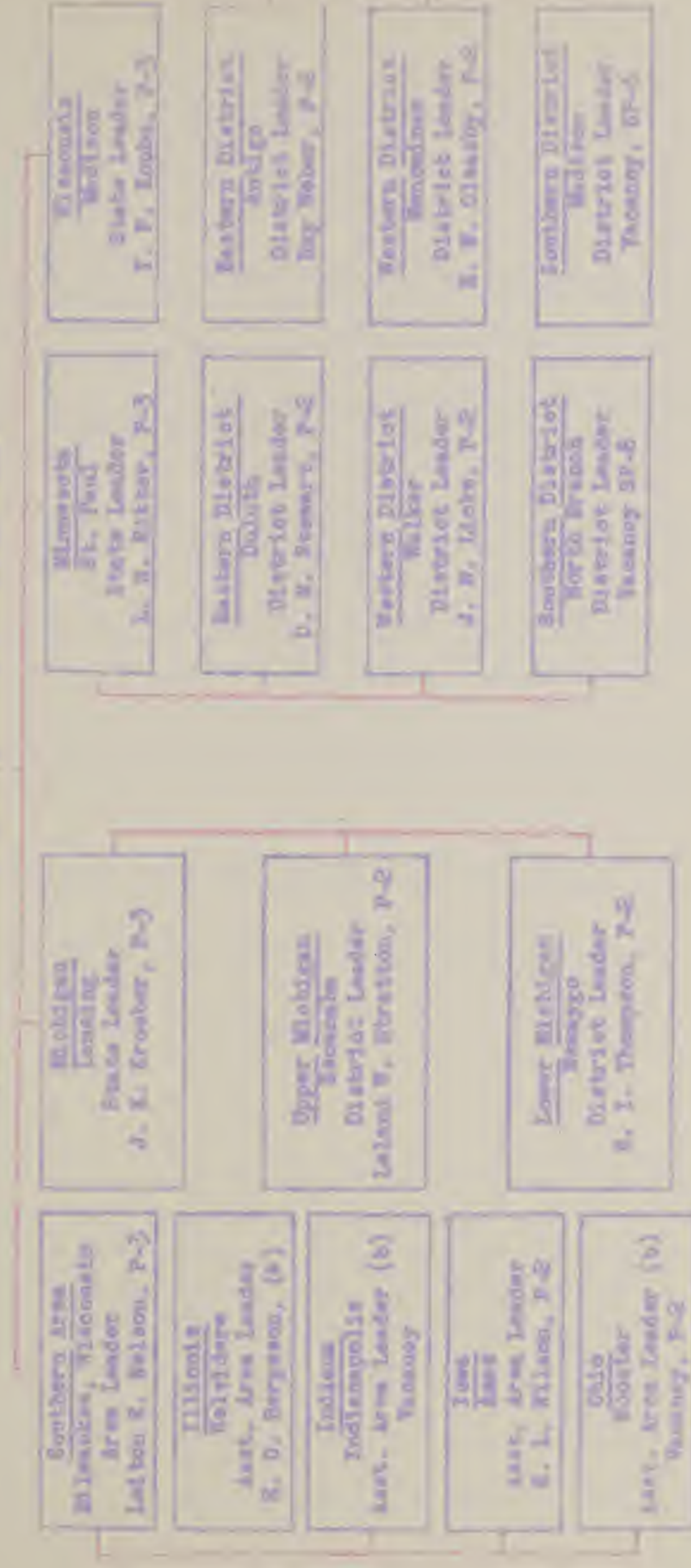
Salvaged Black Current Elimination

No work under this project was performed in 1964. To 1964, 97,051 salvaged black current bushes have been removed from white pine growing areas.

Future Control Program

As in 1944, limited funds and labor available for control work in 1945 will be used on those young stands of white pine most immediately in need of protection. Owing to the rapid intensification of the rust in unprotected stands in the north, work will be concentrated in that portion. The use of over-age men, teen-age boys, white and Indian women as laborers will be continued in 1945, or until the war ends.

Organization Chart, North Central Region, 1964



a - Paid from state funds.
 b - Comes under in Indiana also.

Detailed Narrative Report, 1944

Foreword

As initiated in 1942, the organization of the 1944 report follows the same pattern. It is divided into four main parts, so arranged that separate will be available covering control work on National Forests and Indian Reservations to these respective agencies. The four divisions are listed below:

(1) BLR-1-3. Leadership, Coordination and Technical Direction. This includes summaries, general narrative section, and tables covering all activities. Local control work is included for completeness.

(2) BLR-3-3. Cooperative Blister Rust Control on State and Privately Owned Lands. This includes tables and a discussion by states of work done and status of control on lands in non-federal public and private ownership.

(3) BLR-4. Blister Rust Control Operations on National Forests. This includes tables and discussions of work done and status of control on each of the 11 white pine growing National Forests in this Region.

(4) BLR-7. Blister Rust Control Operations on Indian Reservations. This includes tables and discussions of work done and status of control on each of the 10 Indian Reservations producing white pine in this Region.

BLR-1-3. Leadership, Coordination and Technical Direction of White

Pine Blister Rust Control, North Central Region

Organization

Permanent Organization

The permanent organization in 1944 is shown in the accompanying chart.

There was one major change in the organization. Effective July 1, 1944, the four lower states in the Region: Illinois, Indiana, Iowa, and Ohio, were grouped into the Southern Area under the direct supervision of Mr. Lester C. Nelson, as Area Leader. Blister rust control is fairly well established in this Southern Area. The problem throughout is quite similar, in that the protection of white pine plantations is major. It was felt that more effective supervision and greater flexibility would result by combining these states.

Mr. Oscar J. Doed, formerly State Leader in Ohio and Indiana, was transferred to the Soil Conservation Service in March, 1944. The vacancy so created was not filled, and probably will not until after the war.

Mr. Omer W. Sagar, District Leader in Upper Michigan, was promoted in January, 1944, and his position filled by Leland W. Stratton, effective August 16, 1944.

Mr. L. B. Ester, Minnesota State Leader, was temporarily detailed to the Timber Production War Project in Minnesota from January 16 to March 15, 1944.

The position of Administrative Assistant in the Milwaukee Regional Office occupied by Mr. Paul A. Auge was reclassified from CAF-7 to CAF-9, effective August 1, 1944.

The position of Secretary to the Regional Leader, occupied by Miss Marie L. Maurer, was reclassified from CAF-3 to CAF-4, effective August 1, 1944.

Miss Francis M. Elster, Stenographer, was promoted from CAF-2 to CAF-3, effective May 16, 1944.

The best labor used in 1944 consisted of the over-age men, 50 to 65 years old, who either were reluctant to leave their homes in the north for defense work, or were not physically able to do the hard manual labor of logging. Many of these men had had experience in blister rust control under the W.F.A. program. For the most part they were steady, thorough workers, interested in the protection of the pines in their communities. Often they were effectively used as crew foremen of teen-age boys.

Indian women were again used extensively as ribes eradicators on most of the Indian Reservations. They proved surprisingly proficient, and their accomplishments compare favorably with those of Indian men in former years. Indian women were used as crew leaders. These crews took pride in keeping good alignment and spacing, and in not missing ribes bushes. They did not seem to be irritated by mosquitoes, or the briars, both of which are abundant on Indian Reservations. An important advantage they possess over their men-folk is that there was not the loss of one to several days working time after each pay day.

A crew of young white women under supervision of an older man did good work on the Chequamegon National Forest.

Man-months Employment

From Table 13 it will be noted that there was an employment during 1944 of approximately 1,032 man-months on blister rust control work in the Region. This is an average of 86.0 man per month, with the bulk of employment, 78 percent, occurring from May to September, inclusive. This is the lowest employment in the Region since 1935, when the C.O.O. and other emergency relief programs started. In fact, the 1,032 man-months employed in the calendar year 1944 is less than a third of the number, approximately 3,190 man-months, employed in the peak month of August, 1936 alone.

However, the great majority of men working on blister rust control, 1933 to 1942 were employed on emergency relief programs. In 1944, the employment was principally on State and Regular funds, and represents the second highest employment on such funds since the work was organized on a regional basis in 1931. For example, in 1942, of the 2,664 man-months of employment, 1,888 were paid from emergency funds, leaving only 776 man-months, an average of 64.7 per month on State and Regular funds, compared with 91.0 in 1943, and 86.0 in 1944.

Automotive Equipment

The number of government-owned autos in use and disposed of in 1944 is shown by make and year in the accompanying table. At the end of 1944, we had 12 passenger cars and 36 trucks. The years of manufacture were as follows:

1935 . . .	1 passenger car . . .	3 trucks
1937 . . .	5 passenger cars . . .	5 trucks
1939 . . .	2 passenger cars . . .	25 trucks
1940 . . .	2 passenger cars . . .	3 trucks
1941 . . .	2 passenger cars . . .	0 trucks
<u>Total: . . .</u>		<u>12 passenger cars . . . 36 trucks</u>

We have no automotive equipment newer than 1941. The number of Government automobiles on hand each year is steadily less, as shown following:

Automobiles on Hand, January 1, Each Year

Type	1942	1943	1944	1945
Passenger cars	21	18	13	12
Trucks	56	44	37	36
Total	77	62	50	48

Automobile Accidents

No automobile accidents involving government-owned cars were reported in 1944. This is a commendable safety record, covering as it did, 257,858 miles of travel in 48 automobiles from 3 to 10 years old.

Compensation Cases

There were five compensation cases in 1944, all but one, an eye injury by a member of the Milwaukee Office, sustained in connection with actual field work.

Number of Compensation Cases, Processed Through the Milwaukee Office, 1944

State	Eye Injury	Infection	Cuts, Sprains, Fractures, Bruises	Total	Lost Time Because of Injuries, Calendar Days
Iowa	-	-	1	1	-
Michigan	-	-	1	1	12
Minnesota	-	1	1	2	32
Milwaukee Office	1	-	-	1	-
Total	1	1	2	4	44

Authorization and Sources of Funds

As in the past several years, the work in 1944 was continued under Memoranda of Agreement drawn up between the responsible State Agencies and the Bureau of Entomology and Plant Quarantine. These and other memoranda governing blister rust control are shown in the 1936 Regional Annual Report, and are not repeated here.

During 1944, work was performed on funds furnished from the following sources:

1. State and Private

- a. Direct aid (Ribes eradication matched by 3103 Federal)
- b. Indirect aid (Other services)

2. Federal Blister Rust Appropriation

- a. 3101. Leadership, coordination, and technical direction
- b. 3103. Cooperative blister rust control on State and private lands. (Matched by State direct aid)

Pine infection found in 1944 was chiefly of 1937 to 1941 origin. An area of 10 acres in White Pine Hollow, Polk County, with white pines averaging 600 per acre under hardwoods, showed approximately 20 percent of the pines infected.

Michigan

In Upper Michigan, and the northern half of Lower Michigan, weather conditions were apparently favorable to rust development. Ribes infection was heavy and telia unusually abundant. In the southern half of Lower Michigan a drought in the summer apparently retarded rust development on pines.

Pine infection was initially reported in 1944 from Arenac and Gladwin Counties, bringing to 44 the number of counties where rust on pines has been found. The Gladwin County case is quite interesting. There are about 420 acres of young white pine averaging from 500 to 2,000 per acre. Less than one percent are present. Pine infection, averaging five percent, is generally distributed through the stand. Majority of cankers found on 1940 and 1941 growth, with oldest found on 1937 growth. Ribes cynosbati is the chief ribes, distributed in light to medium concentrations.

Rust on ribes has been found in 19 of the 33 counties in the State. The only counties where rust has not been observed are Calhoun, Hillsdale, Lawrence, and Monroe, in the southwest corner of the State.

Minnesota

Rust on white pines was found for the first time in 1944 in Clearwater and Stearns Counties, and on ribes for the first time in Stearns County. Rust on pines had been reported from 33 counties, and on ribes from 38 counties.

Rust continued to intensify with severity in the northeastern part of the State. Ribes infection was heavy and telia unusually abundant. With 1944 favorable weather we may expect large numbers of cankers formed in 1944 to appear.

Ohio

Only a small amount of scouting was done on our trip. One ribes infection, near previously known infections, was found. There was a hot, dry period in July and August, apparently detrimental to rust development. To date, rust on white pines has been reported from 10 counties, and on ribes from 44 counties.

Wisconsin

Pine infection was found in 1944 for the first time in Green Lake and Crawford Counties, bringing to 98 the counties in which pines have been found infected. Ribes infection has previously been reported from all 71 counties in the State.

effective control of fire, insects and diseases, white pine production can be greatly increased so that the Lake States can again become exporters instead of importers of this most valuable timber tree.

Ownership of White Pine

Acreage figures on ownership of white pine in the control problem are constantly changing, and can only be expressed in approximate terms, as shown following:

Ownership	Statural	Planted	Total	Percent
Forest Service	136,611	56,090	192,701	16.9
Indian Service	49,261	1,195	50,456	4.4
National Park Service	15	-	15	Trace
Non-Federal Public	204,261	76,298	280,559	24.7
Private	575,106	38,390	613,496	54.0
Total	965,234	171,573	1,136,807	100.0

Survey Work and Checking

There are three general types of surveys similar in performance, but differentiated according to the status of control. All survey work is for the purpose of systematically mapping an area and obtaining information on white pine and ribes conditions, sufficient to prepare a plan of control work and estimate of man-days required. The three types of surveys are defined as follows:

1. Preradication survey. This is the initial survey prior to deciding upon, or performing initial local control.
2. Resurvey. This is performed, also prior to initial eradication, where conditions have changed, and the original preradication survey data are known to be inaccurate, or more data are needed.
3. Post-check. This survey is performed on areas worked several years previously. On the basis of the post-check, pine areas are listed as needing reeradication, thrown out because of insufficient pine values, or placed on maintenance.

Survey Work

The real significance of data shown in Table 1 is its application to the permanent records in reducing or increasing the total control problem. The effect of survey work in 1964 is seen in the status of control, Tables 6 and 7, where corrections found in survey work have been made.

Due to war conditions and the need for men in the military forces and defense agencies, very careful consideration was given to obtaining the utmost in terms of pine protection, from labor expended. Furthermore, great care was taken that labor employed on ribes eradication should not be recruited in competition with farming, lumbering, or war defense activities. To avoid this criticism, ribes eradication workers were recruited mainly from high schools, over-age local inhabitants, and Indian women. A discussion concerning labor used in 1944 is given earlier in this report.

Ribes eradication in 1944 was performed with labor provided by Regular-Cooperative funds on State and private lands; by Forest Service-Regular 3104 funds in Michigan, Minnesota, and Wisconsin; by Indian Service-Regular 3107 funds, and Tribal funds on Indian Reservations in Minnesota and Wisconsin, and by Civilian Public Service Camps in Michigan.

The largest acreage worked was under State and private ownership, using Regular-Cooperative funds. The next largest acreage was covered by men employed on Forest Service-Regular funds. The largest number of man-days were employed on Forest Service 3104 funds, followed closely by man-days used on the Regular-Cooperative program.

Wisconsin led the States in the amount of acreage cleared of ribes, followed closely by Michigan, with Minnesota third. The largest number of ribes was destroyed and the greatest number of man-days was employed in Wisconsin, followed closely by Minnesota, with Michigan third in these respects. Particularly in Minnesota, the general abundance of ribes on areas worked on the Superior National Forest and Nett Lake Indian Reservation accounted both for the high number of ribes pulled and of man-days used. The work done in Minnesota was probably the most pressing since blister rust is extremely active in the north portion, and in spite of all efforts is yearly killing tens of thousands of young white pines. These pines cannot be protected in time because of the enormity of the job and the inadequacy of funds and labor to do the necessary control work. Particularly in northeastern Minnesota, careful attention was given to performing ribes eradication on as large contiguous blocks of good white pine as possible which were most in immediate need of ribes eradication. This was done in order to forestall inevitable losses which would have occurred in these stands had not ribes eradication work been performed.

Chemical Eradication

In 1943, chemicals were quite extensively applied to kill ribes. Following recommendations by Mr. Offord, a 50-50 mixture of dry salt and borax was applied to ribes crowns lodged in rocks or deeply imbedded in the soil. Chemical treatments were given to large decapitated R. missouriense bushes in the winter. Dosages of two ounces of the chemical for small crowns, and four or more ounces for large crowns were used.

These chemicals were continued in use in 1944. Observations in 1944 made of 1943 treatments were encouraging. The accompanying table shows the results of treatments of ribes with salt-borax in 1943 in Ohio, as determined by Weiers, Nelson and Bergeson in September, 1944.

Results on September 5 to 10, 1943 of Treatment of Ribes bushes in September, 1943,
 Field, Delly-Grove Dry Bluffs, Ohio
 (Continued)

Plot No., County, Date Treated	Damage per bush	Ribes Species	Original Ribes				Percent Kill		Remarks
			Before		One Year After Treatment		F.L.B.		
			Bushes	F.L.B.	Bushes	F.L.B.	Bushes	F.L.B.	
9-2 Columbiana Co., 9/1-15/43	10.0 on, 25.0 on, 50.0 on.	<u>R. aureum</u> <u>R. aureum</u> <u>R. aureum</u>	1 1 1	50.0 125.0 150.0	1 1 1	25.0 125.0 120.0	0.0 0.0 0.0	50.0 0.0 20.0	Bushes not yet treated, bushy with bushes looked healthy (8/24/43)
9-1 Belmont Co., 9/1-15/43	12.5 on.	<u>R. elaeagnifolium</u>	5	100.0	2	145.0	60.0	75.0	Bushes not yet treated, bushy.
9-2 Columbiana Co., 9/15/43	0 lbs. Total	<u>R. americanum</u>	1 clump	300.0	0	0.0	100.0	100.0	Bushes, broadcast, bushes not yet treated, broadcast, 100
9-3 Columbiana Co., 9/15/43	16 lbs. Total	<u>R. americanum</u>	1 clump	800.0	-	300.0	-	82.5	Bushes not yet treated, broadcast, 100
9-4 Columbiana Co., 9/15/43	12 lbs. Total	<u>R. americanum</u>	1 clump	600.0	-	200.0	-	50.0	Bushes not yet treated, broadcast, 100
9-5 Columbiana Co., 9/15/43	16 lbs. Total Not Treated	<u>R. americanum</u>	1 clump	300.0	-	175.0	-	11.7	Bushes not yet treated, broadcast, 100
9-6 Columbiana Co., 9/15/43	16 lbs. Total	<u>R. americanum</u>	1 clump	150.0	-	150.0	0.0	0.0	No change
9-7 Columbiana Co., 9/15/43	16 lbs. Total	<u>R. americanum</u>	1 clump	350.0	-	350.0	0.0	0.0	Bushes not yet treated, broadcast, 100

and homologous trends in killing rates by dry 50-55 percent of salt and borax are evident in the table.

1. Good killing was accomplished on *E. cynosugeti* when stems were cut flush with the ground or cut to three inches above it. Equally good results were obtained in these instances with dosages of 2.5 ounces to 10 ounces per bush.

2. Less conclusive evidence was obtained of killing of *E. cynosugeti* plants with stems not cut. A 12 ounce dose of chemical killed one *E. cynosugeti* bush with 75 F.L.S. cut out at the time of treatment. Different degrees of killing *E. cynosugeti* bushes with stems not cut varied from 15 percent live-stem killed to 98.1 percent, with the average about 80 percent.

3. After killing parent bushes there was evident an abundance of viable seedlings, undisturbed by the chemical.

4. Even with heavy doses of chemicals, from 10 ounces to 50 ounces per bush, there was unsatisfactory killing of some *E. cynosugeti* growing in heavy sod.

5. Treatment of *E. missouriensis* with chemicals at the rate of 12.5 ounces per bush showed only 55 percent of live-stem killed the following year.

6. Several much clumps of *E. americanus* were treated with varying success. One clump of 300 F.L.S. of *E. americanus*, about 1000, was treated with eight pounds of dry salt-borax in September, 1943. By September, 1944, the stems were all dead. Other similar treatments showed results varying from an injury to 62.5 percent kill. Flooding of the areas had occurred and presumably influenced the killing effect of the chemical.

Mr. Bergeson in Illinois performed some interesting experiments in applying salt and borax on cut crowns of *E. missouriensis* at the rate of about four ounces to 100 F.L.S. during the winter of 1943 - 1944 while the ground was frozen. These areas were inspected several times in 1944 without finding live sprouts or viable seedlings. The advantage of winter treatment, if it is so successful as indicated, is that large bushes are desiccated quite easily when the ground is frozen, and there is little disturbance of the soil to promote seed germination.

Less specific observations in 1944 of 1943 chemical eradication in other parts of the Region bore out the general belief that a 50-50 mixture of dry borax-salt, applied to cut off crowns of upland vines effectively kill the vines.

Status of Control

The present status of control by States and ownership districts is given in Tables 6 and 7 and graphically in Charts 1 and 2. On December 31, 1944, the status of control by States including all ownership is shown in the following table:

State	Control Area	Percent	
		Initially Worked	On Maintenance
Illinois	35,701	42.8	10.0
Indiana	199,408	45.5	26.0
Iowa	60,000	56.3	18.8
Michigan	1,341,101	84.6	24.1
Minnesota	628,762	60.6	13.6
Ohio	401,282	45.6	16.0
Wisconsin	1,355,620	69.9	9.3
Grand Total	4,002,074	66.5	16.1

It is apparent that there is still a great deal of work to be done before the white pine worth protecting is all on a maintenance basis. While nearly seven-tenths of the control area has been initially worked, only 16 percent is on a maintenance basis. Thus, not only is there need for performing initial eradication on approximately 30 percent of the areas, but approximately 53 percent of that already initially worked has to be examined and possibly reworked before it is on maintenance.

From the above table it appears that Michigan, with 85 percent of its control area initially worked and 24 percent on maintenance, is the farthest advanced of all the States toward the goal of having control accomplished around all worthwhile stands. While 26 percent of the control area in Indiana and 16 percent in Ohio are shown as being on maintenance it is probable that a much higher percent can be placed on maintenance in these States when it is possible to adequately examine white pine areas in their southern portions where ribes are relatively scarce or absent.

In the northern part of the three Lake States, especially in northwestern Minnesota, where on many sites white pine is the best possible crop to grow, the favorable seasons since 1937 have very markedly increased the germination and growth of white pine reproduction. This increase in the number of young white pine trees has not only extended the known limits of white pine areas but has also materially tended to increase the stocking of these areas in existing white pine stands.

Unfortunately, however, the conditions favorable to white pine reproduction have also been favorable to rust spread and development. The net result is that in unprotected stands the rust is killing young white pines at a very much greater rate than they are coming in through natural regeneration.

During these war years when funds for blister rust control and labor are scarce, our only sound approach to the problem is to protect the very areas of the crop and to make our funds go as far as possible in saving the greatest number of white pine trees. In so doing, however, it is inevitable that millions of young white pines on tens of thousands of acres will be killed. It is hoped that in the post-war period, funds and labor will be made available so that this destruction of young white pines can be greatly lessened if not halted, and that white pine sites may be permanently cleared of ribes, thus allowing future generations of white pines to grow undamaged in blister rust invaded areas.

As blight rust control workers we must look farther than seeing the existing white pine crop. We must remember that the presence of ribes on a good white pine site destroys not only the existing stand but prevents indefinitely the production of future white pine forests. Thousands of acres in the northern part of the Great Lake States would be best utilized if they were in white pine production. Therefore, as funds and labor permit, the protection of such white pine sites must be taken into consideration in blight rust control plans.

Cumulative Local Control

In Table B, total eradication work by workings, States, and ownership classes are shown from the time work started to and including 1944. Averages for initial workings in Table B are given and will differ from our initially worked averages in Tables C and D. In the latter tables, if an acre after initial working was burned over and pine values destroyed, acres initially worked were removed from the status table. Such acres are retained, however, in Table B, because it is a statement of work done.

It may be noted in Table B that 5,013,157 acres were worked initially; 137,376 acres, or 34 percent worked twice, and only 20,242 acres, or 0.3 percent worked more than twice.

In Table B, ribes destroyed per acre are shown. Since this is a cumulative table with large average and time figures, the per acre figure should be fairly representative of ribes abundance in the State or ownership class concerned. In Chart 3, the average number ribes destroyed per acre for "All Workings" is used, in order to obtain as large a base as possible,

In order of increasing abundance of ribes, starting with the smallest number per acre, the States list up are, Indiana, Ohio, Michigan, Illinois, Wisconsin, Iowa, Minnesota. Iowa is second high primarily because much of the acreage in control areas around shelterbelts consisting only of wind-eroded fields, was not counted. This reduced the number of acres to apply against the number of ribes pulled. The average number of ribes per acre in Minnesota, 189.1, is nearly half again larger than its nearest competitor, Iowa, with 66.2 ribes per acre.

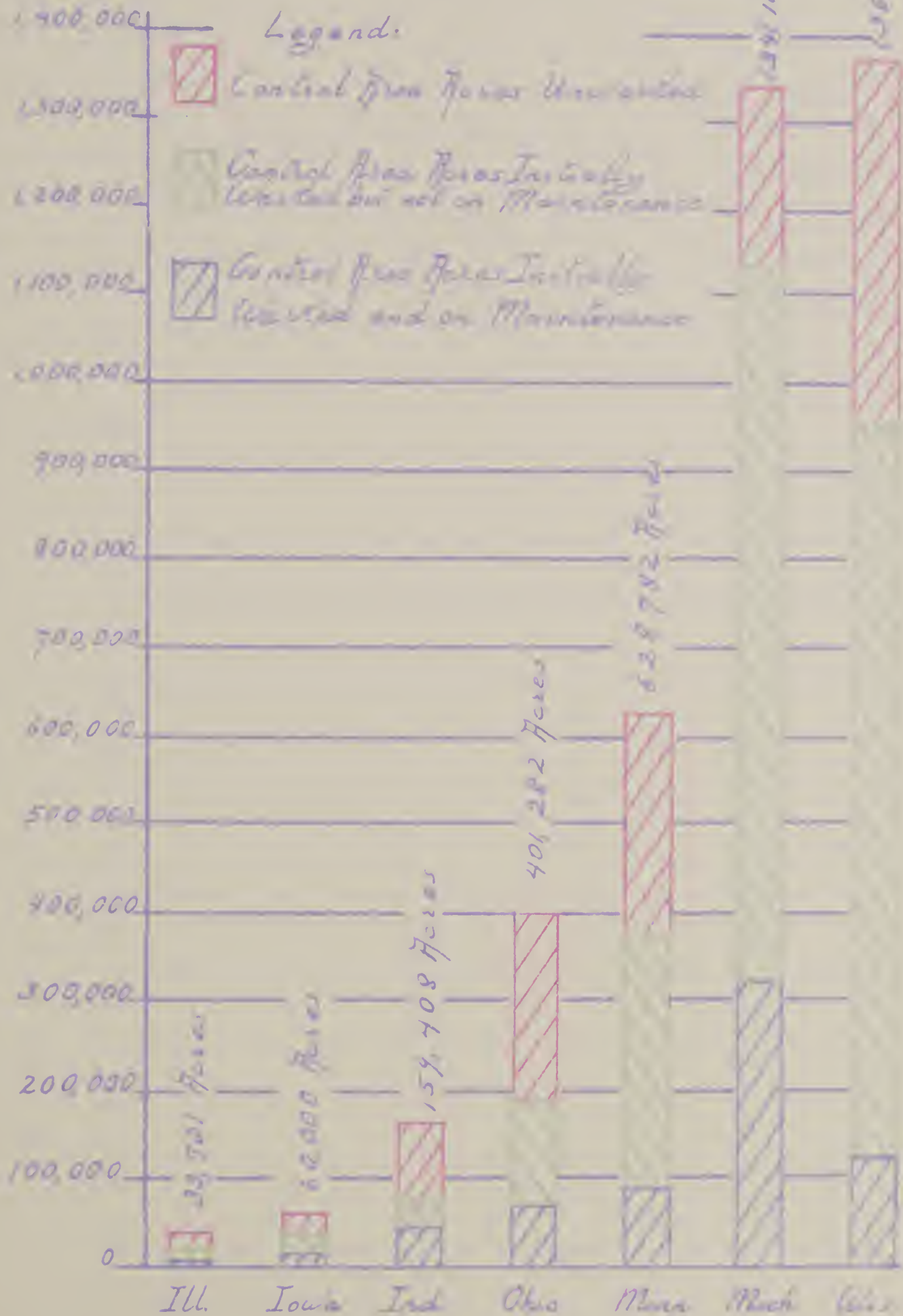
On the basis of acreage classes, ribes destroyed per acre were much more abundant on Indian Reservations, 231.0 per acre, than on National Forests, 59.2 per acre, or on State and Private, 56.0 per acre.

In Table B a summary of ribes eradication, all workings, from inception through 1944 is given by States, ownership classes, and controlling agencies. The chief value of Table B is to show the controlling agencies which have performed ribes eradication on lands under varying ownership. Thus, on lands under Forest Service ownership, Forest Funds have been used to eradicate ribes from 103,755 of the total 374,443 acres worked. On the other hand, Forest Service Funds have been used to work 345 acres out of 2,343,340 acres of private lands worked. It is economically sound for land of all ownerships to be covered for ribes within the working range of a crew of trained men. The working of Forest Service pine by Bureau crews, and of State and private white pine by Forest Service crews can thus be separated off, one against the other.

CHART 1

Status of Control by States, All Workshops,
North Control Region
To December 31, 1944
(Based on Tables 6 and 7)

Heres in Control Areas



7,000,000

CHART 2

Status of Control by Ownership Classes,
All States, North Central Region.
Inception to December 31, 1944
(Based on Tables 6 and 7.)

3,800,000

3,600,000

3,400,000

3,200,000

3,000,000

2,800,000

2,600,000

2,400,000

2,200,000

2,000,000

1,800,000

1,600,000

1,400,000

1,200,000

1,000,000

800,000

600,000

400,000

200,000

0

Legend:



Acrees Unimproved



Acrees Initially Improved
but not on Maintenance



Acrees Initially Improved
and on Maintenance

Acres in Control Area

Indian
Territory

Indian
Territory

Indian
Territory

Indian
Territory

Indian
Territory

374,250 Acres

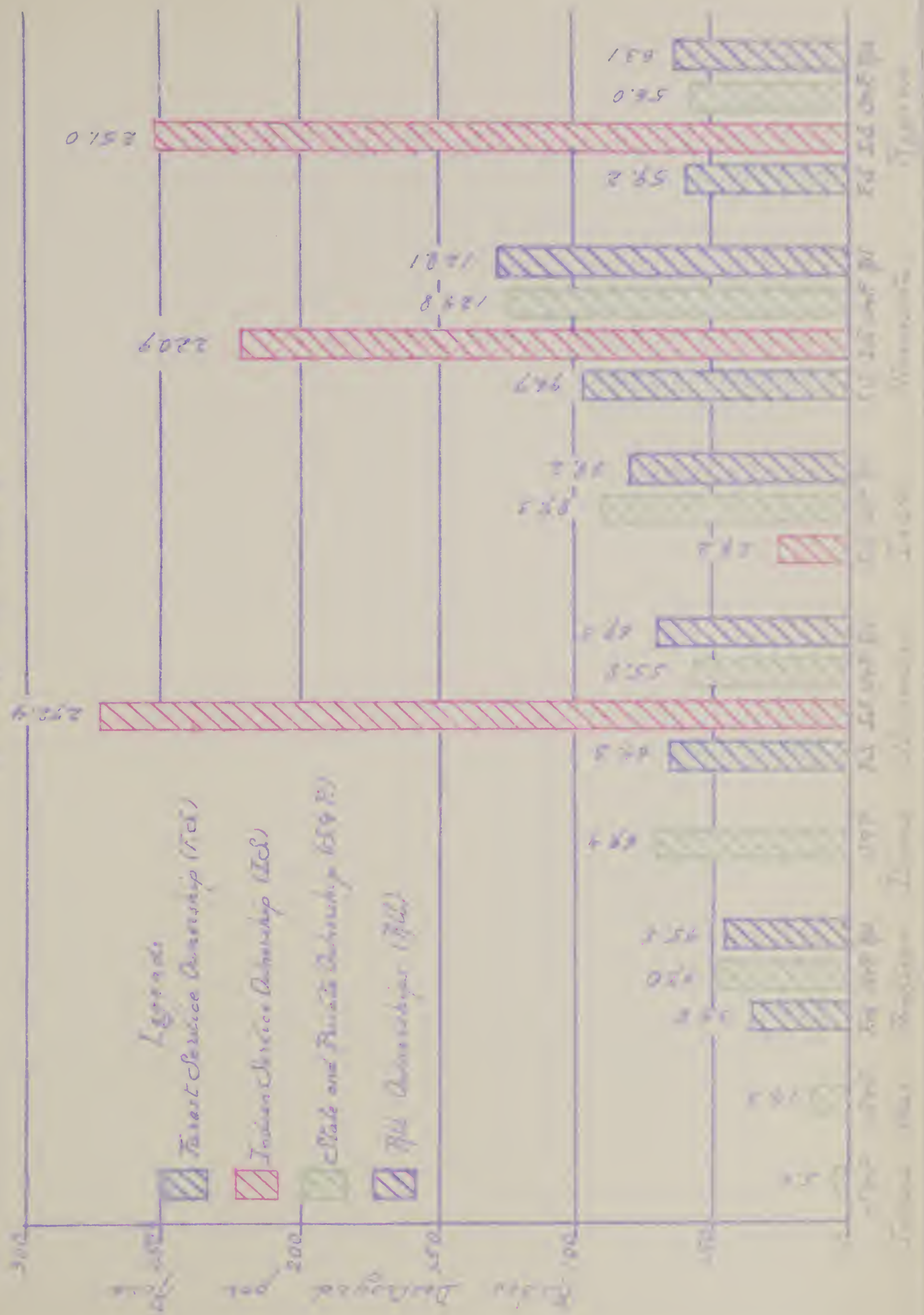
412,125 Acres

743,915 Acres

2,745,051 Acres

3,449,845 Acres

Pilot Destroyed per Type of Status and Ownership Classen All Warships
Inception to December 31, 1944 - North Central Region
(Based on Table 8)



Nursery Sanitation

Work Done 1944

There were five nurseries given sanitation workings during 1944. According to ownership, one was private, one was Forest Service, and three were State. There were 913 ribes removed from 1,699 acres of control area at a cost of 55 man-days. This work provided protection for approximately 16,711,000 white pine trees. In protecting nurseries against blister rust, the full 1500-foot protection zone for all ribes and one-mile wide zone for cultivated black currants are maintained. The reason for this additional protection width is because nursery stock is often grown under overhead watering systems which create more or less optimum infection conditions. In order to maintain ribes-free conditions and to insure as far as possible the production of rust-free white pine planting stock, periodic workings of white pine growing nurseries are performed at least every two years. At the present time, practically all of our white pine producing nurseries, except a few private nurseries, have been protected, and the problem involves chiefly the maintenance of this protection work. Nursery sanitation performed in 1944 is shown in Table 9.

Present Status of Nursery Sanitation

The following table, taken from Omnibus Table 4A, shows the present status and cumulative work done, 1918 to 1944, in nursery sanitation in this Region.

State	Number Nurseries Worked			Total Acres Worked	Total Ribes Destroyed	Total Man-Days Used
	Protective Zones Retained	Protective Zones Dropped	Total			
Illinois	7	1	8	4,330	50,356	376
Indiana	3	3	6	3,750	11,351	57
Iowa	7	2	9	3,436	65,645	317
Michigan	9	4	13	4,686	1,110,819	16,256
Minnesota	9	8	17	5,806	1,324,789	5,011
Ohio	4	9	13	6,131	99,551	1,581
Wisconsin	11	6	17	4,985	879,476	8,189
Grand Total	54	33	87	38,123	2,201,137	32,507

The most usual reasons for not maintaining nursery sanitation zones around white pine producing nurseries are that such nurseries discontinued the growing of white pine, or the prevalence of ribes made the sanitation work too costly to maintain.

Control Area Permits

As defined in Federal Quarantine 63, the States of Michigan, Minnesota, Ohio and Wisconsin are White Pine Control Area States. The interstate movement

of ribes into designated control areas within these States and only in those of such ribes shipments carried a control area permit issued by the proper State Plant Quarantine Officer. The issuing of control area permits is a function of the State which has been carried on for several years. Previous to 1943, however, no record on this activity has been made in our annual reports. A description of the procedure in issuing control area permits is given in the 1943 Annual Report, and will not be repeated here.

As noted in Table 5, during 1944, out of 5,797 applications for ribes shipping permits, 99.7 percent, or all but 31 were approved. Approximately 86 percent of the shipments were made in the spring, and 23 percent in the fall.

Violations of Federal Quarantine 63

As reported by the Division of Domestic Plant Quarantine, there were 79 violations of Federal Quarantine 63, as ribes shipped without permits going into the States of Michigan, Minnesota, Ohio, and Wisconsin, as shown in the following table.

Violations of Federal Quarantine 63

Station Where Intercepted	States of Destination				Total
	Michigan	Minnesota	Ohio	Wisconsin	
Chicago, Illinois	29	-	50	5	84
Pittsburg, Pennsylvania	-	-	1	-	1
St. Paul, Minnesota	-	10	-	-	10
Total	29	10	51	5	95

Cultivated Black Currant Elimination

As shown in Table 10, cultivated black currant elimination was performed only in Iowa and Michigan. The destruction of 3,485 cultivated black currant bushes in one planting in Harrison County is interesting for several reasons. The bushes were old, and practically all found infested with blight rust in 1944. This was one of the largest single plantings of cultivated black currants destroyed in this Region. The destruction was at State expense performed by a State crew engaged in the destruction of neglected vineyards at the time. A tractor dragged two diggers, one to each row. Each digger was controlled by a man walking back of it, and making sure each bush was uprooted. Pulling of the bushes was thus expedited, and performed at nearly walking speed.

To the end of 1944, for the Region as a whole, 288,806 cultivated black currant bushes in 34,765 plantings had been destroyed. There remain exactly 1,000 known plantings with 6,600 cultivated black currant bushes yet to be destroyed. Thus, 99.7 percent of all known bushes have been eliminated.

Canker Pruning

A limited amount of canker pruning in protected areas was performed in Michigan and Minnesota, as noted in Table II. There were 1,884 cankers removed to save 1,578 infected white pines. To date, 126,325 cankers have been removed from 18,890 trees, and 1,653 infected trees have been cut down, chiefly in Michigan and Minnesota. It is believed that when adequate labor is again available, canker pruning on selected crop trees in a protected stand can be economically justified, as a control measure.

Informational Activities

A Blister Rust Control exhibit was placed in the Wisconsin State Fair at Milwaukee. Quite extensive use was made of the eastern blister rust control film. Most showings were presented before school groups but several were given also before various conservation clubs.

Correspondence in connection with issuing control area permits for whipping ribes continued to be an excellent way of acquainting other and pine owners with blister rust control.

Investigational Work

State and District Leaders experimentally treated wild ribes with various dosages of the salt-bore mixture, as described earlier in this report.

A detailed compilation of experienced opinions and data on the ecology of Ribes cynosbati, our most representative upland ribes species, was completed and sent to Mr. Offord.

Three Technical Memoranda, Nos. 3, 4, and 5, were prepared in the Milwaukee Office during 1964. The name and summary of each is shown following:

Technical Memorandum No. 3. Regeneration of *Ribes cynosbati* From Seed After Ribes Eradication, North Central Region,
Issued May 26, 1964.

"Summary"

An analysis was made of regeneration of *Ribes cynosbati* by seed, based on 19 regeneration plots totaling 2,640 acres (2.64 acres) on upland types in five States in the North Central Region. These plots were established prior to eradication and examined in most cases annually for from three to eight years after eradication.

They were analyzed according to various types of disturbance as follows: (1) No disturbance, full shade; (2) No disturbance, full shade; (3) Under some defoliation; (4) Logged and burned; (5) Logged and not burned; (6) Burned before eradication; (7) Grazed.

"An insufficient number of plots and length of time of observations make conclusions not well founded. Certain trends in the effect of disturbance on number and growth of *B. pycnantha* are significant.

"Under no disturbance, half shade, there was a decided increase in seedlings over no disturbance, full shade, although the average size of seedlings remained fairly similar under both conditions up to three years after eradication.

"Logging and burning greatly stimulated germination and growth of seedlings over logging without burning.

"Grazing stimulated the germination and growth of *B. pycnantha* seedlings on one plot heavily grazed by cattle and pigs, where practically no regeneration by seeds was found.

"Based on a random size of one foot or less in diameter and seedling height at clearly visible, the minimum time elapsed between eradication is as follows: Logged and burned; 4 years; Grazed; 4 years; No disturbance, half shade; 6 years; Logged, not burned; 7 years; No disturbance, full shade; indefinite.

"The only record of production of fruit on seedling stands on plots logged and burned, where one record was found on a seedling stand five years after burning, and 12th record on another six years after burning.

"Since the optimum period between workings is that time after all bushes become clearly visible, and before they produce fruit, these plots should be continued in order to obtain further information on this important point."

"Technical Memorandum No. 4. Status of White Pine Control in Northeastern Minnesota. Issued July 15, 1944

Summary

The northeastern Minnesota, including the counties of Carlton, Cook, Itasca, and St. Louis. There are 149,353 acres of valuable white pine inventory, a control area of 391,155 acres. To date, 13 percent of this white pine has been initially treated, and one percent is on maintenance.

"One of the regions is inaccessible, except by air and waterways. Over a million acres of the Superior National Forest have been set aside as a wilderness area.

"During the past three years of forest fire white pine forests, some of the important ones have been completely destroyed. Very often it is found that an important white pine forest is destroyed.

"Due to a combination of conditions favorable to rust development, such as abundance and distribution of ribes, close association with young white pine, and favorable climatic conditions, blister rust is thoroughly established. It has caused the damage shown at many points, and is presently intensifying at an alarming rate.

"According to studies, ribes eradication must be performed on thousands of acres within the next few years to avoid losses of millions of white pine trees from blister rust.

"Work at approximately ten times the present rate annually for the next 20 years would have to be done in order to keep white pine losses from blister rust at an acceptable minimum.

"Since this is not possible in the foreseeable future, the highest work priority as in the past will be given to large or contiguous stands to be managed for future white pine lumber, having an abundance of young white pines, and in which blister rust has not yet prevented the future production of mature white pine forests.

"Many areas exist where conditions favor the continued production of white pine, and on which white pine will be the best crop. When labor conditions permit, such areas should be eradicated of ribes even though the existing pines have been killed by blister rust in order to ensure the continuing production of white pine.

"Conditions as described for northeastern Minnesota are applicable, in a lesser degree, to other parts of the North Central Region, particularly Wisconsin and Michigan."

"Technical Memorandum No. 5 - White Pine Timber Production in the Lake States, Issued December 28, 1944.

Summary

"1. This paper presents data and charts on the annual and cumulative production of white pine in the Lake States in relation to that of other regions. Comparisons are also made between each of the three Lake States, of lumber production and kinds of wood cut. Production and consumption of softwoods in the Lake States are discussed. Lumber-log prices of white pine and other kinds of wood by years are given. Comparisons between the past and present in white pine acreages and timber production are made.

"2. For the period 1664 to 1942, of the total calculated cut of white pine in the United States, 195,032 million board feet, 277,712 or 70.5 percent, were produced in the three Lake States.

"3. For the recent period, 1932 to 1942, there were 13,067 million board feet of white pine produced in the United States. The Northwest produced 36.5 percent of this total, followed in order by the Northeast, 24.4 percent; California-Oregon, 20.8 percent; Lake States, 10.5 percent; and the Southern Appalachians, 2.7 percent.

"6. The calculated white pine production in the Lake States for the period 1864 to 1942 was: Michigan, 193,980; Minnesota, 56,898; and Wisconsin, 77,606 million board feet.

"7. The peak period of white pine timber production was 1879 to 1881 in Michigan; 1889 to 1891 in Wisconsin; and one peak year, 1899 in Minnesota.

"8. For the period 1864 to 1942, of the calculated net of all kinds of wood, 63.8 percent was white pine, 14.7 percent was other softwood, and 21.5 percent was hardwood.

"9. From 1839 to 1905 the Lake States produced much more softwood lumber than they consumed. Since 1905, in the Lake States, softwood lumber imports have increasingly exceeded exports each year.

"10. For the period 1922 to 1936, more softwood lumber was imported into the Lake States from the North Pacific Region alone than was produced and consumed in the Lake States.

"11. During the period 1922 to 1936 there were 3.7 billion board feet of softwood lumber imported into the Lake States from the Lake States. This indicates that the softwood lumber market in the Lake States is still heavily dependent on the Lake States.

"12. For the period 1923 to 1942, the average lumber-log yield per thousand board feet in the Lake States was highest for white pine, 1433 board feet per thousand board feet, followed by hardwood, 1300 board feet per thousand board feet, and lowest for all softwood, 1100 board feet per thousand board feet.

"13. It is estimated that there were originally 33,000,000 acres of white pine in the Lake States. Now, included within the blister rust control area, are only 1,101,282 acres of young white pine, or about 3.3 percent of the original white pine area.

"14. Similarly, it is estimated there were 2,962 million board feet of standing white pine timber in 1943, compared with 248,874 million board feet calculated to have been produced from 1864 to 1942.

"15. The significance of these comparisons is to offer hope for the future. The conditions responsible for the original vast forests - seed, soil, climate - are present. Under proper forestry, efficient control of fire, insects and diseases, white pine production can be greatly increased so that the Lake States can again become exporters instead of importers of this most valuable timber tree."

Costs

Cost figures for the Region during 1944 are shown in Tables 12 to 18, for Minnesota alone; by States and organizations; by States and activities; and by activities and organizations.

A total of \$233,444.24 was spent during the calendar year, with the following percentage distribution by sources:

State and Private	20.1 percent
Bureau 3101	31.6 percent
Bureau 3103	13.7 percent
Forest Service 3104	20.8 percent
Indian Service 3107	13.8 percent
<u>Total</u>	<u>100.0 percent</u>

Of this total, \$233,444.24, approximately 64 percent was spent on field activities directly concerned with the protection of white pine stands by the removal of ribs. The activities entitled "Supervision" against which 30.4 percent of the cost is charged, is misleading. Under this heading are included costs of our permanent skeleton organization, including the Milwaukee Office. State and District Leaders, and to a lesser extent, members of the Milwaukee Regional Office were concerned with all field activities, including ribs eradication, surveys and checking, and making plans for the future. For bookkeeping purposes, however, these costs are shown under "Supervision." A more descriptive title would be "State and District Leaders' Activities." A certain minimum number of trained and qualified men are needed to effectively conduct a blister rust control program, be it large or small. These are represented in the skeleton organization. Naturally the proportionate cost of the skeleton organization to the whole is greater when labor funds are small than when they are large. However, the value of field work done by State and District Leaders during these years of small labor funds will be reflected in good plans for future work to get the most in blister rust protection out of every dollar expended.

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATE LANDS IN THE
NORTH CENTRAL REGION, 1944. WORK REPORT RCR-3-2

Objective of Cooperative Project

The purpose of this cooperative project is to control white pine blister rust on all non-Federal lands, both public and private. Non-Federal Public and Private funds are matched by Regular Federal Funds insofar as appropriations are available. These funds are administered cooperatively by the Bureau of Entomology and Plant Quarantine and State agencies concerned and are spent entirely for local control on state and private lands.

Cooperative Expenditures in 1944

During 1944, as noted in Text Table 4, \$25,133.74 were spent as Direct Aid by state and private cooperators, including states, counties, municipalities and individuals, on the protection of white pine against blister rust. Matching these funds the Bureau of Entomology and Plant Quarantine spent a total of \$32,057.06 of 3103 funds. Thus, a total of \$57,190.80 was spent on local control on state and private lands in this Region. In spite of the omission of funds from Indiana and Ohio in 1942, over \$3,000 more of Direct Aid was contributed in 1944 by five states, than by seven states in 1943.

Control Accomplishments, 1944

In Text Table 1 local control accomplished on these Regular-Cooperative funds on state and private lands is shown. It will be noted that under all workings 40,973 acres of white pine were given protection by the removal of 858,416 ribs from 89,134 acres of control area at a cost of 6,657 man-days. This is a substantial increase of work done over that of 1943.

Only those areas were selected for working containing young white pine and of the greatest value and in most immediate need of protection, irrespective of whether the work was initial or re-eradication.

The Bureau of Entomology and Plant Quarantine used its funds primarily for labor. State and Cooperative funds were used in the employment of labor, supervisors, the assignment of state and county men to control work, the employment of owners of white pines, etc. To a greater or lesser degree, owners contributed toward the protection of their own stands in all of the states. Examples of other types of cooperation on the part of states may be given.

The Huron Mountain Club in northern Michigan contributed \$1,500, matched by an equal amount from the Federal Government for the protection of pine stands on the Huron Mountain Club property in 1944. In Wisconsin, several counties used County Forest Crop Law funds for the employment of rib removal labor on county forests. In Minnesota, a camp was established,

TABLE 2. Cumulative Summary of Local Control on State and Private Lands
North Central Region, 1942-1966. Bureau-State Funds, A-15

State	Ownership Class	Acres White Pine Preserved		Acres Washed	Acres Destroyed	Net Gain Loss	
		General	Planted				Total
Initiated Working							
Illinois	Non-Fed. Public	-	11	11	479	1,891	17
	Private	-	290	290	3,897	112,890	102
	Total	-	301	301	4,376	114,781	119
Indiana	Non-Fed. Public	-	9	9	794	2,202	11
	Private	-	828	828	7,173	62,619	170
	Total	-	837	837	7,967	64,821	181
Iowa	Non-Federal Public	52	28	80	115	11,331	82
	Private	-	81	81	928	21,198	102
	Total	52	109	161	1,043	32,529	184
Michigan	Non-Fed. Public	3,221	1,717	4,938	16,721	104,719	615
	Private	9,082	2,830	11,912	51,518	146,695	2,102
	Total	12,303	4,547	16,850	68,239	251,414	2,717
Minnesota	Non-Fed. Public	507	22	529	913	28,571	1,207
	Private	-	2	2	33	2,002	3
	Total	507	24	531	946	30,573	1,210
Missouri	Non-Fed. Public	-	223	223	3,160	17,281	170
	Private	127	1,663	1,790	15,683	77,572	242
	Total	127	1,886	2,013	18,843	94,853	412
Wisconsin	Non-Fed. Public	1,022	3,120	4,142	20,310	141,208	1,070
	Private	15,304	243	15,547	43,387	370,812	2,342
	Total	16,326	3,363	19,689	63,697	512,020	3,412
Oregon	Non-Fed. Public	7,301	5,224	12,525	12,525	370,096	5,175
	Private	25,923	5,176	31,099	222,249	1,014,281	2,400
	Total	33,224	10,400	43,624	234,774	1,384,377	7,575

(Cont'd)

Text Table 2, (Cont'd) Cumulative Summary of Local Control on State and Private Lands, North Central Region, 1922-1961, Bureau-State Forms 812-3

State	Ownership Class	Acres White Pine Protected			Acres Marked	Aibres Destroyed	Days	
		Natural	Planted					Total
All Workings								
Illinois	Non-Fed. Public	102	848	950	1,096	142,086	40	
	Private	33	693	726	6,151	174,125	5	
	Total	135	1,541	1,676	7,247	316,211	45	
Indiana	Non-Fed. Public	-	572	572	2,804	13,989	20	
	Private	-	528	528	7,175	42,419	37	
	Total	-	1,100	1,100	9,979	56,408	57	
Iowa	Non-Fed. Public	27	45	119	850	102,890	155	
	Private	-	170	170	1,707	25,357	70	
	Total	27	215	242	2,557	128,247	225	
Michigan	Non-Fed. Public	12,132	3,303	15,435	17,031	251,890	1,000	
	Private	17,593	1,821	19,414	80,742	600,335	1,000	
	Total	29,725	5,124	34,849	97,773	852,225	2,000	
Minnesota	Non-Fed. Public	1,913	259	2,172	5,531	180,780	2,000	
	Private	-	26	26	106	6,293	6	
	Total	1,913	285	2,198	5,637	187,073	2,006	
Ohio	Non-Fed. Public	-	1,575	1,575	5,577	17,029	20	
	Private	127	1,846	1,973	10,421	27,540	70	
	Total	127	3,421	3,548	16,008	44,569	90	
Wisconsin	Non-Fed. Public	14,119	5,981	20,100	15,783	277,761	2,000	
	Private	40,343	1,589	41,932	111,517	576,519	1,000	
	Total	54,462	7,570	62,032	127,300	854,280	3,000	
Region	Non-Fed. Public	28,333	12,432	40,765	153,920	665,815	2,000	
	Private	58,896	6,626	65,522	222,119	1,544,785	10,000	
	Total	87,229	19,058	106,287	376,039	2,210,600	12,000	

Table 3. Status of Control on Non-Federal Public and Private Lands,
North Central Region, December 31, 1944, Net Acres

Ownership Class	Total Control Problem, Acres			Initially Planted			Initially Worked, Acres			Not Initially Worked, Acres			On Balance, Acres		
	Non-Fed. Pub.	Private	Total	W. P.	W. P.	Total	W. P.	W. P.	Total	White Pine	Control Area	White Pine	Private	Control Area	
Illinois															
Non-Fed. Pub.	197	994	1,191	192	924	1,116	1,116	6,186	75	1,679	615	1,683			
Private	34	991	1,025	34	747	781	781	8,241	244	17,445	46	1,697			
Total	231	1,985	2,216	226	1,671	1,897	1,897	14,427	999	34,124	661	3,380			
Indiana															
Non-Fed. Pub.	99	1,888	1,987	99	1,762	1,861	1,861	15,647	126	1,819	839	9,094			
Private	266	4,333	4,599	266	2,817	3,083	3,083	56,631	1,516	84,720	1,835	32,365			
Total	365	6,221	6,586	365	4,579	4,944	4,944	72,278	1,642	96,539	2,674	41,459			
Iowa															
Non-Fed. Pub.	300	163	463	288	108	396	396	2,624	67	987	1	987			
Private	304	4,488	4,792	199	2,472	2,671	2,671	50,671	2,121	25,618	974	11,285			
Total	604	4,651	5,255	487	2,580	2,967	2,967	53,295	2,188	31,605	975	12,272			
Michigan															
Non-Fed. Pub.	107,597	36,550	144,147	97,455	34,105	131,560	131,560	308,966	12,691	32,408	47,645	109,715			
Private	235,019	11,533	246,552	191,010	9,540	200,550	200,550	890,446	46,002	164,443	38,644	199,688			
Total	342,616	48,083	390,699	288,465	43,645	332,110	332,110	1,200,412	58,693	196,851	86,289	309,403			
Minnesota															
Non-Fed. Pub.	64,095	15,401	79,496	29,215	6,037	35,252	35,252	72,877	24,194	53,340	8,539	18,693			
Private	60,232	639	60,871	67,134	437	67,571	67,571	207,485	21,160	69,902	15,080	56,078			
Total	124,327	16,040	140,367	96,349	6,474	102,823	102,823	280,362	45,354	123,242	23,619	74,771			
Ohio															
Non-Fed. Pub.	730	5,039	5,769	725	3,117	3,842	3,842	39,450	1,325	15,068	1,155	11,900			
Private	2,273	9,732	12,005	2,121	6,458	8,579	8,579	144,656	3,126	200,767	2,035	90,517			
Total	3,003	14,771	17,774	2,846	9,575	12,421	12,421	184,106	4,451	215,835	3,190	102,417			
Wisconsin															
Non-Fed. Pub.	50,775	16,263	67,038	45,403	15,130	60,533	60,533	161,273	6,001	21,994	10,049	28,944			
Private	260,910	6,874	267,784	171,823	5,089	176,912	176,912	679,860	78,480	567,266	30,742	95,222			
Total	311,685	23,137	334,822	217,226	20,219	237,445	237,445	841,133	84,481	789,260	40,791	124,166			
Michigan															
Non-Fed. Pub.	204,261	76,238	280,499	173,446	61,835	235,281	235,281	607,023	45,079	126,892	68,872	116,091			
Private	575,106	30,390	605,496	432,387	28,160	460,547	460,547	1,815,190	152,949	929,861	49,426	367,077			
Total	779,367	106,628	885,995	605,833	89,995	695,828	695,828	2,422,213	198,028	1,256,753	118,298	483,168			

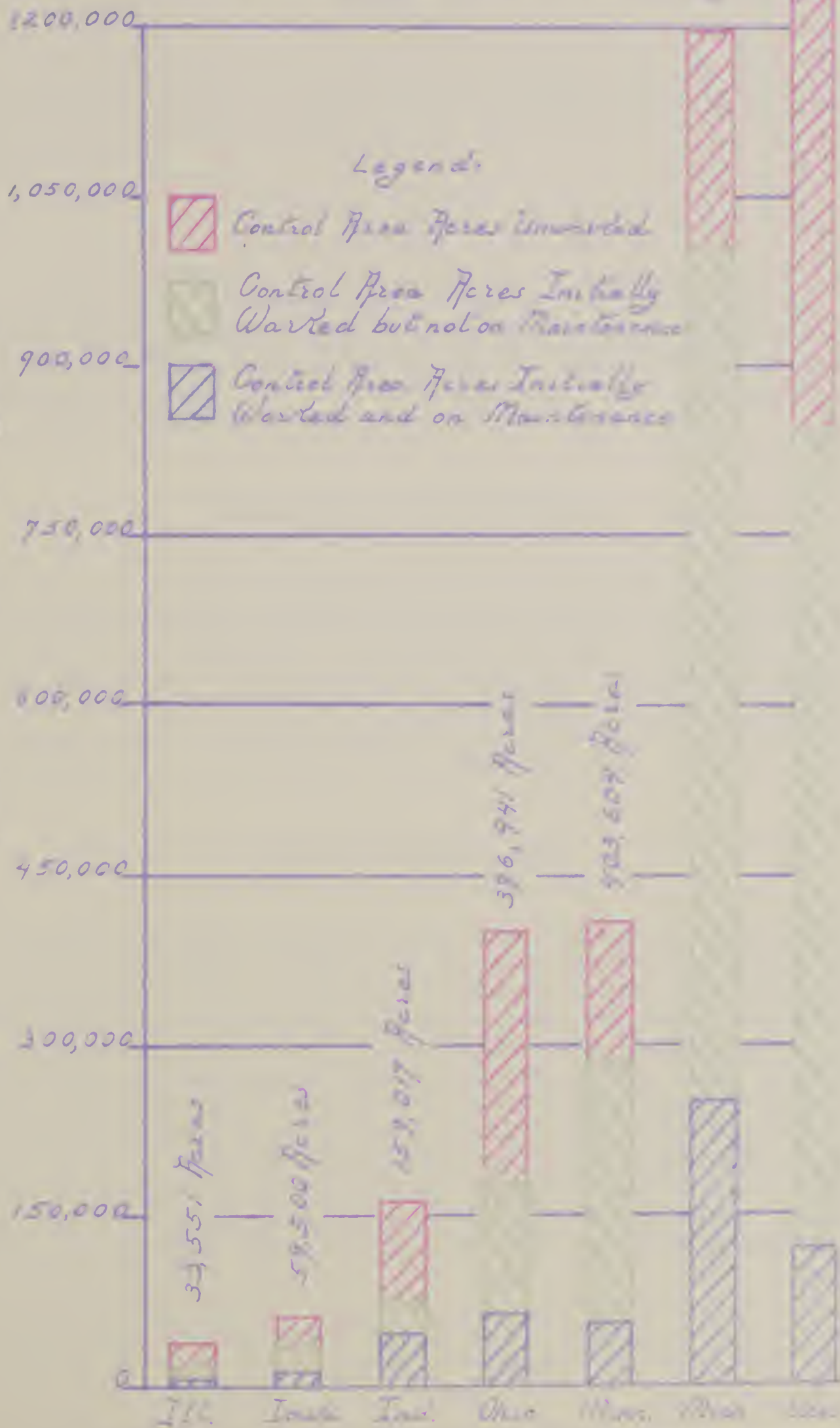
Text Table 4. Costs of Local Control, HLR-3, on State and Private Lands,
North Central Region, 1964

State	State and Private Cooperation, Direct Aid	Bureau Cooperation 3103	Grand Total
Illinois	\$5,169.30	\$5,005.68	\$8,174.98
Indiana	-	1.70	1.70
Iowa	3,204.10	1,787.79	4,991.89
Michigan	6,590.44	7,408.50	13,998.94
Minnesota	4,175.62	7,273.30	11,448.92
Ohio	-	2.77	2.77
Wisconsin	7,994.28	10,577.32	18,571.60
Region Total	27,133.74	26,857.06	57,990.80

ONPAT 4

Status of Control for Crag
and Private Lands, by States,
North Central Region
To December 31, 1944
(Based on Test Tables)

Acres in Control Plans



BLISTER RUST CONTROL ON NATIONAL FORESTS,
FOREST CONTROL SECTION, 1944, PROJECT BLR-4

Foreword

To assist Forest Agents accompany this report. There were insufficient changes in status in 1944 to justify the preparation of new maps. The reader is referred to maps with the 1943 report.

Objective

The objective of the Blister Rust Control Program on National Forests is to protect against blister rust all valuable white pine stands under Forest Service ownership. This involves initial and subsequent riber eradication within infested distances of white pine stands in order to bring such stands through to commercial maturity free from blister rust damage.

Memorandum of Understanding

Control work on National Forest lands is performed through a written Memorandum of Understanding between the Forest Service and the Bureau of Entomology and Plant Quarantine. The Forest Service is responsible for selection of pine areas to be protected, employment of labor and supervision, and operations of camps. The Bureau is responsible for the preparing of work plans and maps, keeping records, making reports, training of labor and supervision, and checking the adequacy of the control work.

Protective Zone Widths

Blister rust control involves the removal of riber bushes within a pine stand and for a sufficient distance around it to assure protection. Formerly, this protection zone width was 900 feet. Within recent years this width has been reduced materially depending on forest types concerned. In live swamps of alder, cedar, etc. the zone width has been reduced to approximately 50 feet, or one tree width. Studies have failed to show serious damage to pines from swamp riber, except for short distances. Riber eradication in swamps is expensive. Due to perpetual moist conditions, and ability of riber to regenerate by layering, it is almost impossible to permanently eradicate riber in swamps. For these reasons, it is wiser to accept a small loss, if any, among pines bordering the swamps in preference to the relatively high cost of swamp riber removal. The eradication of riber in swamp borders removes those most dangerous to the pines.

The zone width in dense woodland has been reduced to approximately 300 feet and in open woodland to 600 feet. The severing effect of forest growth

The number of new acres damaged each year is smaller and is decreasing because of living pine foliage and defoliation of ribes leaves by the rust before sporadic production. Elimination by death of all white pine trees is complete to the degree that the forest is no longer a white pine stand. Not only are existing white pines killed by blister rust, but also white pine reproduction as it appears. The length of this period is indefinite. It continues as long as living pine foliage is present and the sensitive ribes faster matures.

Studies of pine infections in this Region, particularly in the north, by Dr. Henry and others have shown that on areas where ribes and white pines are closely associated the rust builds up so rapidly that in 5 to 15 years, after the rust hits, there is nearly complete pine infection and shortly thereafter, elimination of white pine as a type of importance in the stand.

Surveys made by Dr. Henry on four ranger districts of the Superior National Forest in 1942 show the rust to be widely distributed and for the most part to be in the introductory stages. Areas of course exist where the rust has already reached the damage stage, and these areas are getting larger and more numerous every year. Dr. Henry's surveys indicate that at the present rate of increase we can expect heavy intensification of the rust and the damage stage in which 90 percent of the pines in unprotected stands will be infected and killed within 5 to 15 years.

General Status of Control

In Text Table 4 and Chart 5 there is shown the status of control by National Forests in Region 5 as of December 31, 1944. The total control area containing 192,701 acres of white pine is 413,103 acres. Of this total, 212,177 acres, or 51.5 percent, have been initially worked, and 103,671 acres, or 25.1 percent are on maintenance. Most of the initial work remaining involves natural white pine, since all but 2,797 acres of the 56,090 acres of planted white pine have been initially worked. The great bulk of initial work yet to be done is on the Superior. It will also be noted that only an insignificant acreage of white pine on the Superior is on maintenance. Most of the white pine plantations not yet initially worked are on the Chippewa National Forest.

Total control work performed in 1944 is shown in Text Table 5. Initial work was done on the Huron, Manistee, Keweenaw, Marquette, Ottawa, Superior, and Chippewa National Forests. Re-eradication, chiefly second working, was performed on the Manistee, Marquette, Ottawa, Keweenaw, Nicolet, Chequamegon, Superior, and Chippewa National Forests. Of the 27,142 acres worked in 1944, approximately 28 percent was initial working, 56 percent second working, and 16 percent third working.

Labor was largely paid from Forest Service Regular Funds, 3104. A small amount of work was done on Bureau Regular funds 3101 on the Huron and Manistee Forests, and also from G.P.S. camps performed ribes eradication on the Manistee. Three-age boys were effectively used as laborers in camps on the Superior and Marquette National Forests, over-age men on the Nicolet and Chequamegon, and white women on the last named Forest.

In Text Table 6 are shown the results of systematic chiming effort for 1944 ribes eradication. For the entire work an average of 9.6 pounds per

views and the Elster Rust Control District Leader, the latter examines prospective white pine planting sites prior to planting in order to encourage the planting of white pine on sites where ribes are not abundant.

Burns National Forest - Michigan

The present control problem consists of 362 acres of natural pine, 1,250 acres of planted pine, within a total control area of 6,577 acres. All this has been initially worked, and 63 percent of it is on maintenance.

During 1944, 1,125 acres of control zone around 160 acres of planted pine were checked initially for ribes by the District Leader. None were found in the course of eight days of searching. Checking afterwards also failed to show ribes.

Rust conditions remained the same as in 1943. Rust on ribes was generally distributed but known pine infections are limited to a few trees each near Mio, Lincoln, and East Tawas.

Very little control work is recommended for 1945, other than the checking of areas to be planted to white pine. The same excellent working agreement described for the Marquette is in effect on the Burns.

Marquette National Forest - Michigan

A relatively large control program was in operation in 1944 in the Moran and Keweenaw Districts. Details of work done are shown in Text Table 5. Ribes eradication was performed by a group of 15 to 20 Keweenaw High School boys. The Forest Service housed and fed them in a C.O.C. Camp on the forest, furnished transportation and direct supervision. Technical direction of the work, training of crews, and checking was furnished by the Elster Rust Control District Leader's office.

Results of checking after ribes eradication are shown in Text Table 6. Excellent eradication work was done, with only an average of 1.6 bushes and 2.4 F.L.B. per acre remaining after working. All of the 9,967 acres worked were in the 0 to 15.0 F.L.B. per acre class after working.

About equal acreage of planted and natural white pine make up the 10,766 acres listed for protection. There remain approximately 517 acres of natural pine to be initially protected. About 37 percent of the pine acreage, chiefly in the northern third of the forest, is on a maintenance basis.

Rust on ribes is generally prevalent on the forest. Pine infection has been found at three localities: south of Moran, northwest of Eudyard, and southwest of Kew. While additional pine infections were found in 1944, there was no increase in the known range of the rust on the forest.

Work remaining to be done involves the initial protection of 517 acres of white pine requiring the removal of ribes from 1,910 acres of control area, and rework where needed. A listing of all areas by Ranger Districts, in order of priority of need, has been made.

forest. It has reached the damage stage in several unprotected white pine areas. Much can be done on both fronts practically wherever pines and rust are in association. Factors responsible for this condition are the greenlands of pines throughout the stands of white pine, particularly young trees, and favorable climatic conditions. This last factor usually encourages white pine reproduction. However, it is suggested that the rust is killing young white pine trees faster than they can be replaced by natural reproduction. The rust is not doing damage in protected stands.

Work planned for 1945 should be on a sufficient scale, so far as labor conditions permit, to maintain protection by reseedation on areas of young white pine initially worked several years ago, and to perform initial work most urgently needed. Lists have been prepared by Ranger Districts giving in order of need the areas of white pine. These lists will ensure the best use of labor available in furnishing bluster rust protection.

St. Croix National Forest - Wisconsin

The general control problem on the St. Croix in 1944 remains approximately the same as that shown in the 1943 report. Listed for protection within the control areas are 5,368 acres of natural and 6,636 acres of planted pine, making a total of 11,004 acres. The total control area involved is 26,236 acres. In December 31, 1944, 4,808 acres of natural and 5,686 acres of planted pine have been initially protected by removing slash from 25,008 acres. Thus, there remain to be partially protected 666 acres of natural white pine. The amount of white pine on maintenance, 166 acres is negligible. Thus, the essential problem involves the furnishing of initial protection to those areas needing it and performing reseedation on most of the total acreage in order to establish satisfactory conditions on valuable white pine stands in the forest.

Most of the white pine lies in the Eagle River and Argonne Districts in the north and in the Lakewood District in the south.

In 1944 stand reseedation was performed on initial work on 7,120 acres and as second working on 7,160 acres. Pines pulled and saw-logs used are given in Part Table C. Work was confined to Eagle River and Lakewood Districts. On the Eagle River District two seven-man crews of high school boys, without previous bluster rust control experience, did good work under supervision of an experienced man. On the Lakewood District a crew of nine local men, experienced in forest reseedation, did exceptionally good work, so good, in fact, that work performed was ahead of that scheduled and most listed for 1945 was done in 1944.

Checking after reseedation showed average per acre figures of 4.3 bushes and 15.0 ft.-lb. of ribes left. All but 30 acres, or 99.3 percent of the 7,120 acres worked show less than 25 ft.-lb. per acre.

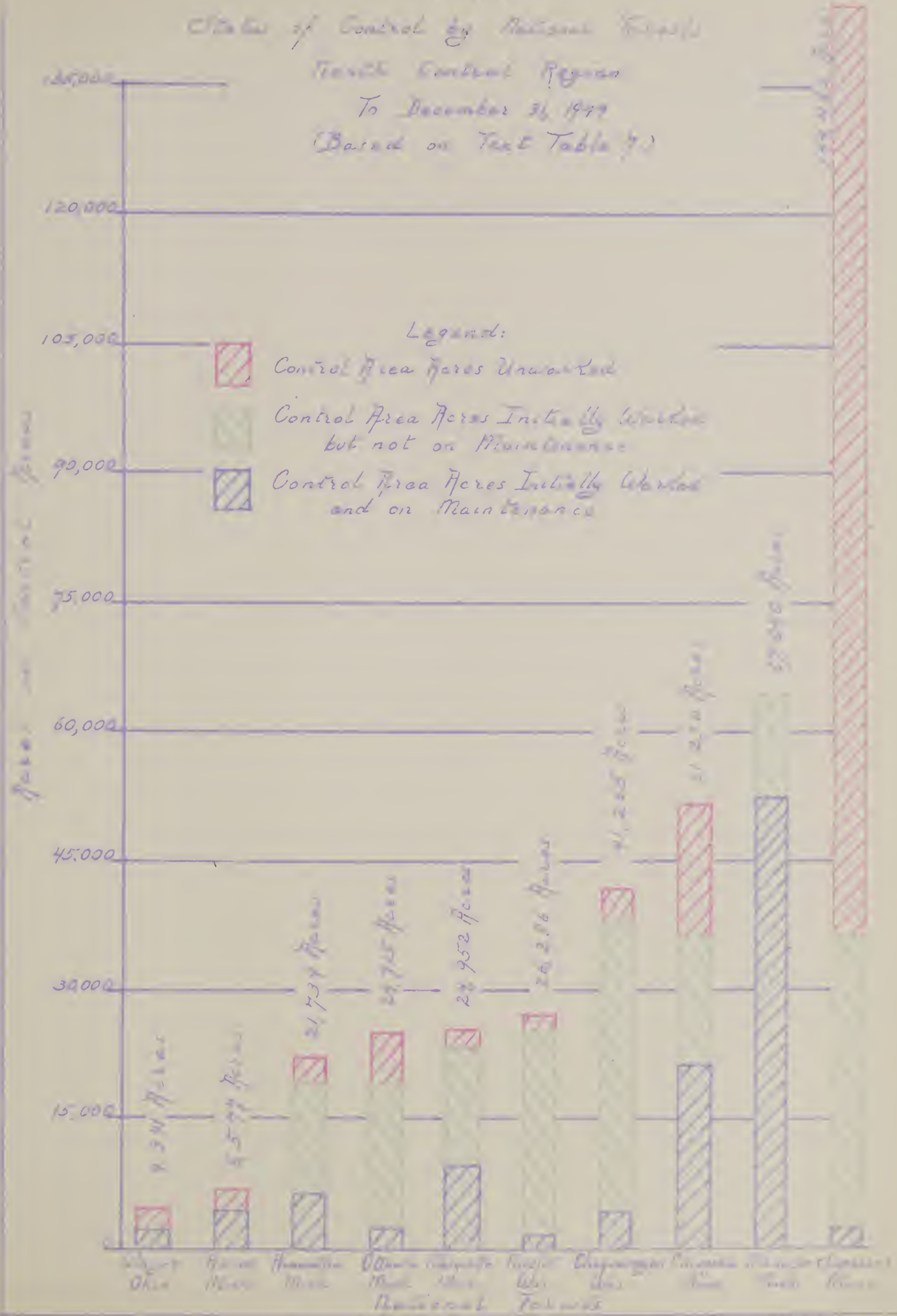
Blister rust is abundant and well established throughout the forest wherever the two host plants are associated. In examination in 1943 of two small plantations, namely the Phelps School Forest in Township 43N., R. 13E. and the Consolidated Plantation in Township 31N., R. 13E. showed 90 percent and 61 percent of the trees infected, respectively. The association of host plants and favorable weather conditions are factors responsible for the rapid intensification of blister rust which is taking place. It is already too late to save certain white pine areas in the forest and unless adequate measures are taken in the next two years a serious loss of young white pine trees is inevitable.

State of Control by National Forests

North Central Region

To December 31, 1949

(Based on Text Table 7)



Based on Consider Table 2.8 class 2.1

Work remaining and planned for the coming season included initial marking of 45 acres and second marking of 475 acres of control area, requiring an estimated 600 man-days of labor. The necessary work is around good stands of white pine, highly valued because there are no equally valuable species to replace the white pine if it is destroyed by silver rust.

Vermillion Indian Reservation - Minnesota

There are 72 acres of natural white pine with a control area of 160 acres on the Reservation. All of this has been initially marked several years ago.

No work was done in 1944. During 1943 the entire 160 acres of control area were given second eradication by the removal of 25,650 ythrs at a cost of 235 man-days. Rises were abundant on spruce, averaging 150 per acre. Labor consisted of one crew of seven Indians, young girls and old men, under the leadership of a local spruce boss. The crew worked slowly but performed thorough eradication work.

White pine infection is general in this locality, pine infection was found for the first time near the western edge of the pine area in 1943. It is expected, however, that eradication has been sufficiently timely to prevent serious loss.

Red Lake Indian Reservation - Minnesota

No work was done on the Red Lake Indian Reservation during 1944 and 1945 and the status of control remains the same as last shown in the 1942 report. This Reservation contains the largest amount of white pine of all the Reservations located in Minnesota. There are 18,770 acres of white pine listed as worth protection of which all but 72 acres have been given initial protection. While only 1,120 acres of white pine are shown as being on maintenance, it is probable that surveys would identify additional acres of white pine in this category.

The main body of white pine lies on the peninsula projecting between Upper and Lower Red Lake. A considerable number of smaller areas, many of which are on a maintenance basis, are found immediately north of Lower Red Lake. Silver rust was first detected on both pine and spruce in the summer of 1935. Fortunately, initial local control work was performed that year and in subsequent years, thus forestalling damage to white pine which would have occurred had they not been protected in time.

No work is planned for the Red Lake Reservation in 1945. If opportunity permits, post-checking should be performed to determine when additional work is required to prevent rises from rebuilding to dangerous concentrations. It is believed, however, that necessary additional work on the Reservation can be postponed for a few years without serious loss to white pine.

White Birch Indian Reservation - Minnesota

No work was performed in 1943 and 1944 and the status of current species the same as that shown in the 1942 census. There are 125 acres of white pine on this Reservation, all of which has been initially protected and a considerable portion of it removed. It is believed that the pine is adequately protected, at least for the present, although some of it is listed as being in jeopardy. Pine lumber was first for the first time in 1942.

No control work is scheduled for this Reservation in 1945. As time permits, post-checking could be desirable, to determine the current status of the pine and to schedule for protection any areas needing reinforcement.

Red River Indian Reservation - Minnesota

There are 6,511 acres, almost entirely natural white pine, listed for protection involving 15,776 acres of control area. Of this total, 5,311 acres have been initially removed, leaving 2,201 acres on which initial work is needed. The white pine survey on this Reservation has not been planned as a separate. Surveys conducted in 1943 indicate there are several hundred acres of good white pine not listed in the control program which should be protected.

Substituted pine infection has been found on the Reservation. Most of it is of recent origin, since 1938. An analysis of samples found indicates that pine infection is increasing very rapidly in distributed areas. These concentrations are heavy.

In 1944, initial eradication was performed on 171 acres surrounding 27 acres of pine. A total of 178,783 white was removed at a cost of \$21,444. The tremendous abundance of white is indicated by the fact that approximately 625 white per acre were pulled.

Work was the major activity in 1944. To protect 266 acres of pine 510,100 white were removed from 555 acres of control area at a cost of \$21,444. The enormous abundance of white on this Reservation is indicated by the fact that on several working sites white were removed at the rate of 600 per acre. The areas chosen for this work were selected cooperatively by the Indian Service and the Illinois Pest Control Organization. Labor for work performed in 1944 as in 1943 consisted primarily of Indian women. These Indian women worked very well for the type of white eradication and weeding which had to be covered. Most of the white are of the prostrate type, requiring only a minimum of effort to pull out. The Indian women were unable to cover the ground quite as fast as men, but on the other hand, they did a more thorough job of white eradication. There was little supervision among the women and only a small amount of turnover is experienced.

The 555 acres that were worked and checked showed that 25 feet of live-white per acre, with an average of 2.0 bushes and 16.3 white per acre. Considering the large number of white on this Reservation, the checking results show good eradication work.

A definite work program for 1945 will be submitted at a later date to include initial weeding around white pine stands found recently, and not yet listed in control program. This work, with plans for necessary removal, will require at least 2 crews of 4 men each for the season.

In view of increased acreages of young pine found in 1944, and the fact that work is not ordered and intensifying at a rapid rate, an enlarged control program is recommended for the coming field season, in order to prevent as much loss as possible. It is hoped funds will be made available for initially entering 2,785 acres using 750 man-days, and performing second working on 500 acres using an estimated 500 man-days. This increase in acreage of white pine is not shown in the existing Status of Control Table, but will appear in the 1945 Report.

U.S. Fish and Wildlife Indian Reservation - Wisconsin

No work was performed in 1943 or 1944 and none is recommended for 1945 in this Reservation. There are 1,355 acres of natural white pine, involving a control area of 6,227 acres. All of this white pine has been given initial working. While none of it is on white-pine, the reason is primarily that post-harvesting has not been done here.

At the present time no infestation on either white pine or spruce has been found. It is probable, however, that careful inspections throughout the Reservation would show the need to be primary.

The chief work at the present time needed on this Reservation is post-harvesting, in order to determine what areas can be placed on white-pine and what areas require additional working. From previous knowledge of conditions, it is probable that there is still the immediate need for river-conditions here as there is on other reservations in the region.

Expenditures

Expenditures for river evaluation by Indian Reservations and sources of funds for 1944 are shown in Table 14. Federal Indian Service (FIS) funds were spent on six reservations in the total amount of \$25,945.77. In addition \$5,395.95 of Wisconsin Indian Tribal Funds were used in local control, making a total of \$31,341.72, furnished by the Indian Service. In addition, chiefly for mapping, surveying, checking, technical cooperation, keeping of records, etc., Bureau of Entomology and Plant Quarantine funds were spent as part of its responsibilities towards the control program on Indian Service lands.

Recommendations for 1945

Specific recommendations are given in discussions of the work on each reservation. In addition, more plans and budgets prepared cooperatively between the representatives of the Indian Service and the Forest Service Control Organization have been supplied.

In general, work recommended for the fiscal year 1945 is given the same areas and intensities in kind of work as before, after taking into full consideration the availability of funds. Following the successful use of control work on river evaluation in 1943 and 1944, it is probable that continued use of this type of labor will be made in 1945 and 1946.

Table 10. Local Control on Indian Reservations, All Performed by the Indian Division,
North Central Region, 1944

Indian Reservation	No. Areas	Local White Pine Prescribed		Areas Control Areas Worked	Phone Business Destroyed	Subsist- ance Days Used
		Natural	Planted			
<u>Initial Working</u>						
San-Fox, Iowa	1	-	35	294	10,482	121
Grand Portage, Minn.	1	75	-	124	386,337	352
Red Lake, Minn.	1	32	13	120	169	140
Red River, Minn.	1	99	-	171	150,720	401
Lea Court Orellias, Wis.	1	380	-	518	10,071	301
Secord, Wis.	5	3,057	-	3,795	125,074	1,476
Total, Initial Working	10	4,658	48	5,042	626,853	2,381
<u>Second Working</u>						
San-Fox, Iowa	1	-	10	205	3,532	37
Grand Portage, Minn.	3	224	-	516	150,501	395
Red Lake, Minn.	2	31	72	207	136,402	1,094
Red River, Minn.	1	264	-	598	310,400	321
Lea Court Orellias, Wis.	1	572	-	639	7,000	142
Secord, Wis.	1	140	-	205	30,413	240
Total, Second Working	6	1,201	82	2,160	626,853	1,095
<u>All Working</u>						
San-Fox, Iowa	2	-	45	500	14,074	158
Grand Portage, Minn.	4	508	302	1,330	540,838	987
Red Lake, Minn.	3	63	85	327	136,571	1,194
Red River, Minn.	2	363	-	599	465,120	1,322
Lea Court Orellias, Wis.	2	792	-	957	17,071	443
Secord, Wis.	6	4,217	-	4,000	155,687	1,716
Total, All Working	18	5,683	432	7,716	1,293,363	3,898

Table 11. Results of Checking After Ribes Bradstone on Indian Reservations, North Central Region, 1944

Indian Reservation	No. Areas	Areas Worked	Checking After Bradstone				Classification of Worked Areas on Basis of Ribes F.L.S. Left After Bradstone			
			Strip Acres	Ribes Found	Ribes per Acre	F.L.S.	F.L.S. (Acre)	F.L.S. (Acre)	F.L.S. (Acre)	F.L.S. (Acre)
Grand Portage, Minn.	3	560	4.86	145	106.6	9.3	22.3	156	90	116
Red Lake, Minn.	3	327	4.70	55	54.7	7.0	11.0	225	102	
Red River, Wis.	2	599	13.20	120	183.0	9.8	16.3	-	599	
La Crosse, Wis.	2	957	17.10	93	165.0	5.6	9.0	957		
Winnebago, Wis.	6	2,000	12.60	108	204.0	9.0	17.0	1,370	630	
Total	14	14,504	13.16	506	150.0	1.7	11.1	4,196	1,221	116

* - 1 Area with 70 acres worked, not officially checked.

Note: Work on Fox Reservation, Iowa, 2 areas, 500 acres worked, administratively, not quantitatively, checked and found 0.8.

Test Table 12: Status of Control on Indian Reservations, North Central Region,
on December 31, 1964. Net Acres

Indian Reservation	Total Control Problem, Acres			Acres Initially Worked			Acres Not Initially Worked		Balance
	Planted		Total Control Area	Planted		Total Control Area	Planted		
	N. P.	W. P.		N. P.	W. P.		White Pine	Plus Area	
<u>Grand Total</u>	45	5	50	45	5	50	-	-	-
<u>Minnesota</u>									
Grand Portage	936	938	1,874	-	365	500	572	702	-
North Lake	5,092	5,150	7,055	98	5,130	5,902	20	65	3,692
Ind Lake	12,311	12,570	19,800	187	12,498	19,982	72	233	1,120
Forestation	72	72	166	-	72	106	-	-	-
White Earth	477	495	1,163	15	495	1,163	-	-	-
<u>Grand Total</u>	24,053	24,353	40,398	390	24,353	40,398	764	1,003	4,773
<u>Wisconsin</u>									
Red River	6,518	6,331	16,974	13	3,910	7,645	2,403	9,358	-
Lao Court, Illinois	2,928	2,945	8,899	428	2,703	8,018	233	841	110
Lao on Flomberg	1,956	1,956	6,227	-	1,956	6,227	-	-	-
Grand Total	19,629	19,963	39,619	390	16,948	29,953	2,955	6,463	-
<u>Grand Total</u>	43,682	44,316	79,017	778	44,316	79,017	5,112	12,864	4,883

Text Table 13. Summary of Blister Bradication, All Workings, on Indian Service
Lands, by States and Operating Agencies, North Central Region,
from Inception to December 31, 1944. Gross Acres

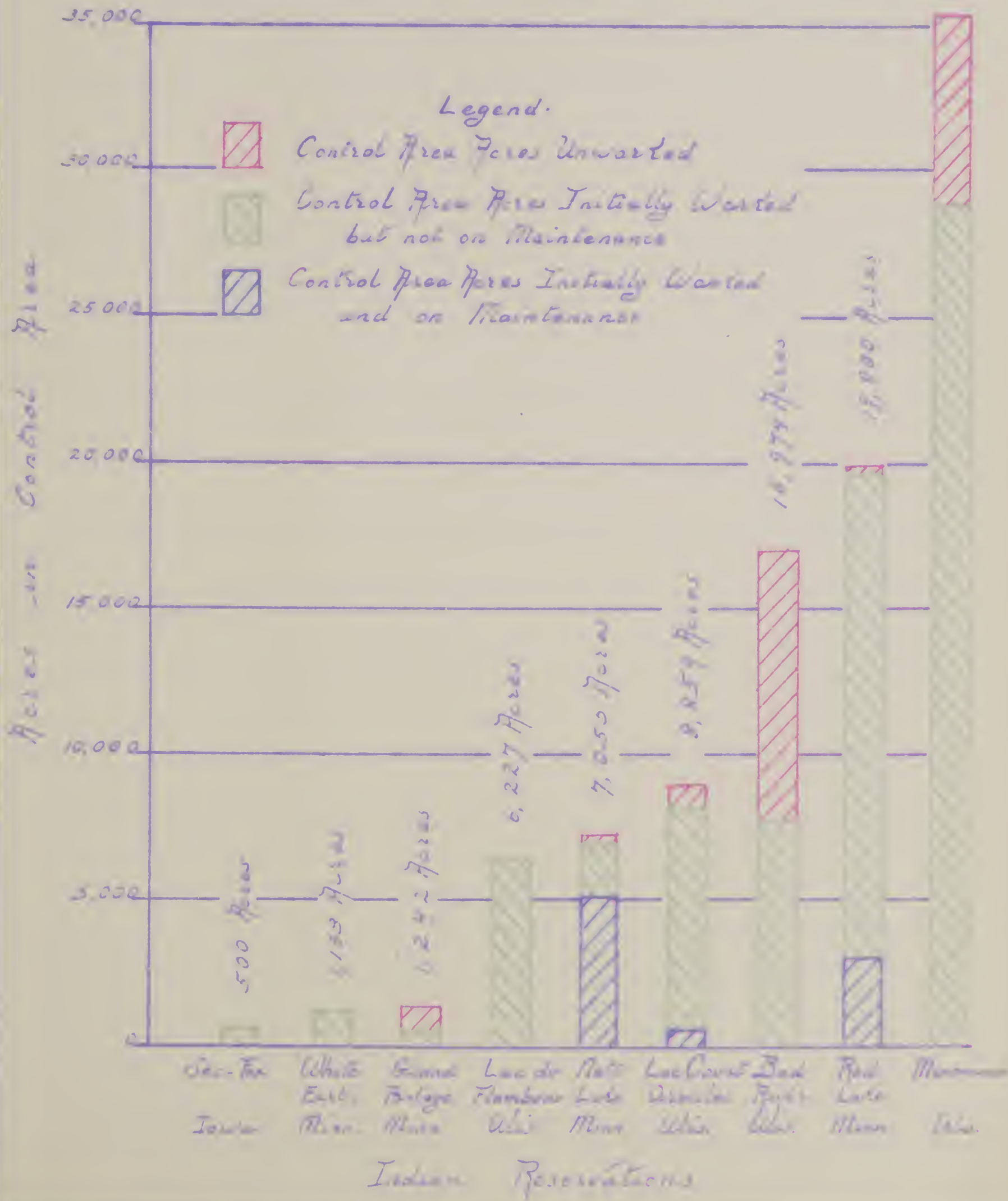
State	Operating Agency	Gross Acres Worked	Blister Destroyed	Squads Used	Per Acre	
					Blister	Squads
Iowa	Indian Service	775	11,000	220	14.2	0.28
Minnesota	Indian Service	29,520	11,017,803	25,451	222.5	0.52
	Bureau-State	375	5,305	110	14.1	0.29
	Total	30,895	11,023,108	25,561	220.8	0.52
Wisconsin	Indian Service	30,850	11,000,000	75,000	355.1	0.52
Region	Indian Service	130,850	30,908,083	99,850	252.2	0.52
	Bureau-State	375	5,305	110	14.1	0.29
Region Total		134,225	36,213,388	99,960	267.2	0.52

Text Table 14. Indian Service Funds Spent on Blister Rust Control,
North Central Region, 1944

Reservation	I. S. 1947	Tribal	Total
Sac-Fox, Iowa	\$730.65	-	\$730.65
Grand Portage, Minn.	5,714.05	-	5,714.05
Wet Lake, Minn.	8,868.05	-	8,868.05
Red River, Wis.	9,568.30	-	9,568.30
Law Court Ojibwa, Wis.	2,270.15	-	2,270.15
Menominee, Wis.	5,009.77	\$6,335.75	11,345.52
Region Total	29,910.97	6,335.75	36,246.72

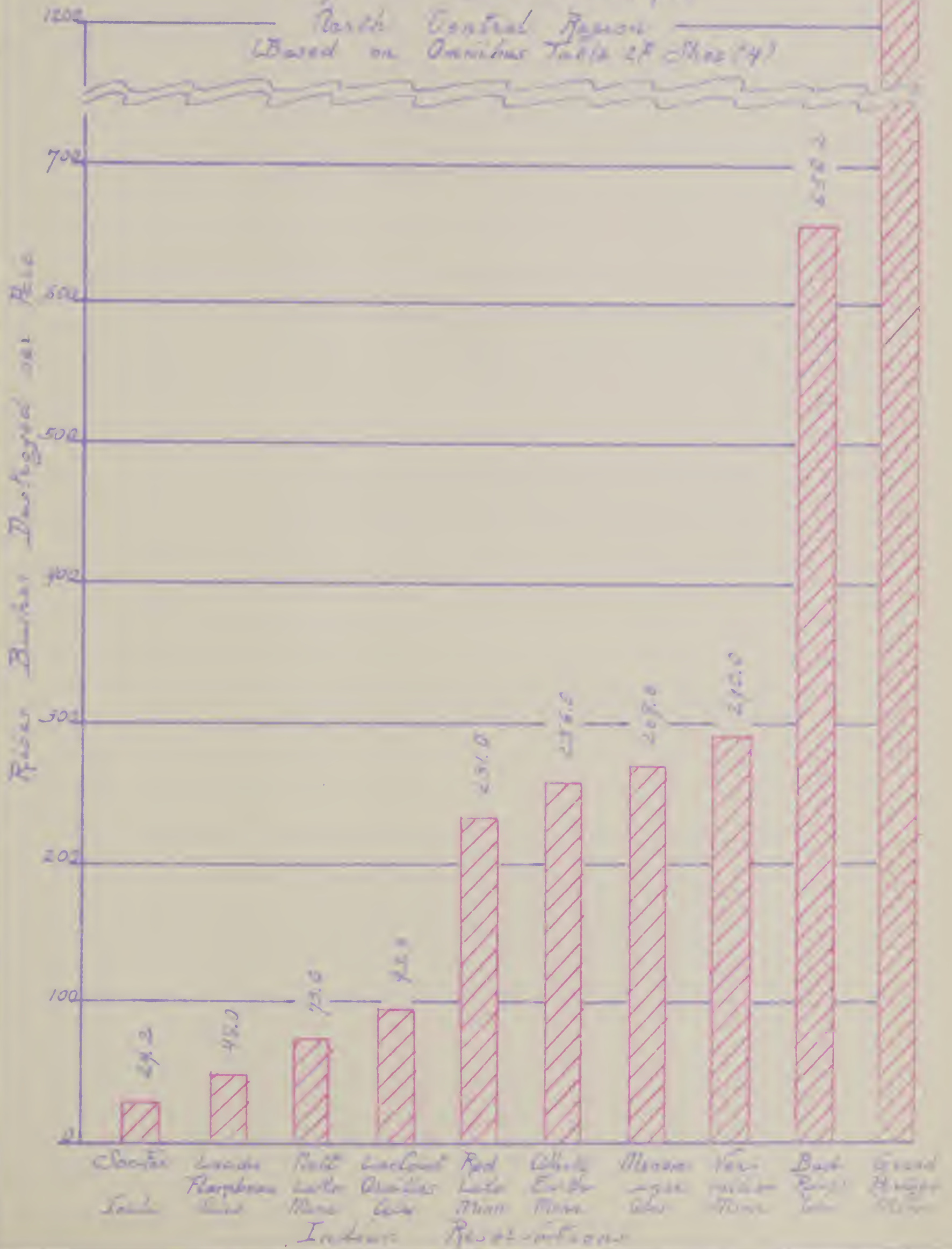
CHART 7

Status of Control by Indian Reservations
North Central Region
To December 31, 1944
(Based on Text Table 10)



Ribes Destroyed per Acre All Growings
by Indian Reservations
Inception to December 31, 1944

North Central Region
(Based on Omnibus Table 2F Sheet 4)



State	Work Agency	Number Arms	Native Wildlife Game Prescribed		Average Sighted	Number Bills Destroyed	Total Billions Man-Days Used
			Deer	Planted			
Total Working							
Illinois	Reg.-Coop.		23	25	30	9,114	205
	Reg.-Coop.						
	I.B.-Reg.			39	35	10,190	111
Minnesota	Reg.-Coop.	119	9,332	796	4,185	155,664	182
	P.B.-Reg.	12	1,015	820	1,965	10,508	103
	P.B.-O.P.S.	8	230	176	305	12,512	51
Minnesota	Reg.-Coop.	6	202	36	203	59,185	837
	P.B.-Reg.	6	151	135	286	61,500	409
	I.B.-Reg.	2	110	11	121	386,506	132
Michigan	Reg.-Coop.	20	11,657	523	12,180	206,118	1,386
	P.B.-Reg.	6	356	200	556	16,690	457
	I.B.-Reg. and Tribal	7	1,506		1,506	293,805	2,176
Oregon	Reg.-Coop.	105	15,949	1,023	16,972	684,019	3,298
	P.B.-Reg.	31	3,552	1,195	2,707	121,666	1,049
	P.B.-O.P.S.	8	230	116	346	12,012	51
Oregon	I.B.-Reg. and Tribal	10	1,955	106	1,702	690,853	3,021
Totals			20,108	2,104	21,297	1,000,112	1,200

(Continued)

Table 2. (Cont'd.) Summary of Local Control of Bluetongue and Epizootics, South Central Region, 1984

State	Farm Agency	Number Animals	Local White Flys Processed		Animals Marked	Number Bluetongue Destroyed	Total Bluetongue Animals Used
			Infected	Released			
All Herdings							
Illinois	Ref.-Coop.						
	Ref.-Coop.	10	53	45	111	95,127	857
	L.B.-Reg.	2		15	500	16,074	168
Missouri	Ref.-Coop.	155	10,843	2,852	13,155	129,134	1,163
	Ref.-Reg.	30	6,381	6,402	8,729	135,366	2,077
	Ref.-C.F.R.	20	380	319	979	14,090	62
Minnesota	Ref.-Coop.	9	376	44	123	81,901	1,141
	Ref.-Reg.	17	754	445	1,239	231,405	2,581
	L.B.-Reg.	7	325	83	118	271,409	2,181
Wisconsin	Ref.-Coop.	78	27,532	1,103	28,321	294,713	2,362
	Ref.-Reg.	14	1,169	1,986	2,790	155,463	2,222
	L.B.-Reg. and Ref.	10	2,332		2,332	643,970	3,161
California	Ref.-Coop.	303	17,241	1,300	18,731	838,139	6,809
	Ref.-Reg.	87	6,226	1,145	12,732	592,034	6,880
	Ref.-C.F.R. and Ref.	12	260	319	579	14,090	62
Total	L.B.-Reg. and Ref.	19	2,497	380	2,859	1,333,161	9,940

Table 2a Summary of Local Control by Station and Ownership Classes
North Central Region, 1944

State	Ownership Class	Number Acres	Acres White Pine Protected Subtotal	Planted Total	Acres Worked	Rubber Trees Destroyed	Total 8-Year Min-Days Used
Initial Working							
Illinois							
Iowa	Private	1	-	35	35	3,438	6
	Indian Service	1	-	35	294	10,182	111
	Non-Federal Public	7	28	20	392	46,414	205
Total							
Michigan							
Minnesota	Forest Service	25	1,330	1,133	5,995	15,058	221
	National Park Service	3	15	15	120	13	0
	Non-Federal Public	30	222	349	3,974	10,372	59
Total	Private	52	1,070	250	12,507	152,961	737
Total							
Minnesota							
Wisconsin	Forest Service	6	151	135	126	24,500	425
	Indian Service	2	110	11	234	386,506	732
	Non-Federal Public	6	282	36	158	59,183	837
Total							
Wisconsin							
Wisconsin	Forest Service	6	305	200	1,120	46,650	457
	Indian Service	7	1,516	-	2,484	293,865	2,178
	Non-Federal Public	12	569	400	2,056	63,014	344
Total	Private	25	11,900	63	18,515	143,104	1,012
Total							
Region							
Region	Forest Service	35	1,867	1,428	7,941	126,268	1,087
	Indian Service	10	1,650	16	3,012	690,853	3,021
	National Park Service	1	15	15	120	13	0
Total	Non-Federal Public	55	879	863	6,920	166,983	1,444
	Private	103	44,570	363	31,891	306,555	1,827
Total							
Region Total							
Total							
Total							

(Cont'd)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes
North Central Region, 1944

State	Ownership Class	Number Acres	Acres White Pine Protected		Acres Worked	Number Bites Destroyed	Total 5-Bear Man-Days Used
			Estoral	Planted			
Third and Other Workings							
Illinois	Private						
Iowa	Non-Federal Public	1					
Michigan	Forest Service	2	375	-	690	5,165	80
	Private	1	100	-	100	13	2
	Total	3	475				
Minnesota	Forest Service	1	-	90	100	18,294	226
	Private	1	-	20	40	3,783	34
	Total	2		110			
Wisconsin	Forest Service	4	944	90	1,736	12,529	652
	Non-Federal Public	1	20	-	172	25,000	192
	Private	3	105	461	2,328	46,744	547
Region Total						117,372	

(Cont'd.)

Table 2a. (Cont'd.) Summary of Local Control by Status and Ownership Classes
North Central Region, 1944

State	Ownership Class	Number Areas	Areas White Pine Protected		Areas Reforested	Timber Rises Destroyed	Total R-Roads and Highways Road
			Actual	Planted			
All States							
Illinois	Non-Federal Public	4	10	52	42	4,357	95
	Private	11	33	509	542	63,117	681
Iowa	Indian Service	2	-	15	15	12,074	168
	Non-Federal Public	10	63	145	111	95,127	687
Michigan	Forest Service	54	4,205	4,964	9,990	104,754	2,134
	National Park Service	1	15	-	15	13	0
	Non-Federal Public	13	4,905	1,577	6,476	77,964	402
	Private	105	9,083	294	9,382	259,079	1,374
Minnesota	Forest Service	17	794	445	1,239	237,405	2,531
	Indian Service	7	305	52	445	677,659	2,181
	Non-Federal Public	8	374	86	100	78,118	1,107
	Private	1	-	20	20	5,783	31
Wisconsin	Forest Service	14	1,109	1,305	2,750	150,163	2,302
	Indian Service	10	2,322	-	2,322	641,678	5,481
	Non-Federal Public	38	2,582	1,030	3,532	73,171	587
	Private	55	24,550	73	24,623	211,512	1,135
Region	Forest Service	85	6,360	7,011	13,981	328,122	6,329
	Indian Service	19	2,607	125	2,825	1,335,161	5,810
	National Park Service	1	15	-	15	13	0
	Non-Federal Public	103	7,944	2,121	10,321	328,177	2,798
	Private	157	29,877	696	30,373	537,881	3,324

Ownership Class	Work Agency	Number Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-hour Man-days Used
			Setback	Planted			
Forest Service							
	Reg.-Coop.	11	Initial Working		1,960		12
	F.S.-Reg.	24	290	209	490		
	F.S.-O.P.B.	3	1,552	1,155	2,707	121,669	2,019
			25	105	130	1,510	26
Indian Service							
	I.S., Reg. and Tribal						
National Park Service Reg.-Coop.							
Non-Federal Public							
	Reg.-Coop.	63	14,165	352	14,517	297,055	1,302
	Reg.-Coop.	5	205	51	256	7,502	25
Private							
Forest Service							
	F.S.-Reg.	39	Second Working		16,827	365,837	5,105
	F.S.-O.P.B.	4	5,728	5,253	253	2,049	23
			30	205			
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
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Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
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Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
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	I.S., Reg. and Tribal						
Non-Federal Public							
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	I.S., Reg. and Tribal						
Non-Federal Public							
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	I.S., Reg. and Tribal						
Non-Federal Public							
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Private							
Forest Service							
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Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
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Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
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Forest Service							
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Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
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Forest Service							
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	I.S., Reg. and Tribal						
Non-Federal Public							
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Non-Federal Public							
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Forest Service							
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	I.S., Reg. and Tribal						
Non-Federal Public							
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Forest Service							
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Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
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	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						
Indian Service							
	I.S., Reg. and Tribal						
Non-Federal Public							
	Reg.-Coop.						
	Reg.-Coop.						
Private							
Forest Service							
	F.S.-Reg.						
	F.S.-O.P.B.						</

Tables 6 and 7. (Cont'd) Status of Control by States and Ownership Classes,
North Central Region, December 31, 1944

Ownership Class	Total Control Problem				Net Acre Initially Marked				Net Acre Not Initially Marked		Net Acres of Milestones	
	Natural Planted		Total		Natural		Total		White		White	
	White	Pine	White	Pine	White	Pine	White	Pine	White	Pine	White	Pine
Minnesota												
Forest Service	99,893	11,046	110,741	195,732	13,039	9,137	62,226	72,447	68,515	123,385	12,277	23,097
Indian Service	18,850	375	19,225	29,666	18,236	303	18,561	28,603	664	1,043	4,794	7,011
Non-Fed. Public	44,095	13,401	57,496	126,217	29,215	6,087	35,302	72,877	24,194	53,340	6,539	18,660
Private	28,292	439	28,731	277,381	67,134	437	67,571	207,485	21,160	69,902	15,080	55,376
Ohio												
Forest Service	-	520	520	4,341	-	200	200	1,875	320	2,665	200	1,675
Non-Fed. Public	798	5,039	5,837	94,518	795	3,117	3,912	49,450	1,925	15,068	1,185	11,046
Private	2,272	9,732	12,005	302,623	2,121	6,498	8,579	111,656	3,626	200,767	2,085	50,311
Wisconsin												
Forest Service	17,044	11,618	28,662	67,551	16,113	11,086	27,179	62,692	1,883	4,849	2,077	4,849
Indian Service	30,411	775	31,186	67,479	24,782	775	25,537	50,824	5,649	16,645	116	511
Non-Fed. Public	50,775	16,263	67,038	185,264	45,603	15,434	61,037	161,273	6,001	21,991	10,049	25,511
Private	246,918	6,874	253,792	1,017,126	171,623	5,689	177,312	679,860	78,680	367,266	30,742	52,502
Region												
Forest Service	136,611	56,040	192,701	413,183	66,550	53,313	119,863	272,177	72,845	141,006	39,008	103,677
Indian Service	49,261	1,195	50,456	97,425	43,020	1,125	44,143	79,737	6,313	17,688	4,912	8,577
Non-Fed. Public	15	-	15	120	15	-	15	120	-	-	-	-
Private	204,261	76,298	280,559	713,915	173,645	61,935	235,580	607,023	45,079	126,892	68,872	116,960
Private	575,106	30,390	605,496	2,715,051	632,587	28,160	660,547	1,815,190	152,949	927,861	89,446	367,377

* - Included as nonaffiliated small acreage of land under Federal control
of U.S.D.A., Department of Agriculture, and Bureau of Reclamation.

Table 8. (Continued) Summary of Local Control by State, Workings, and Ownership Classes.
From Inspection in December 31, 1944, North Central Region
Gross Acres

State	Ownership Class	Gross Acres White Pine Protected	Gross Acres Worked	Number of Rides Destroyed	Total 8-Hour Man-Days	Average Per Acres Worked		Average No. Rides Destroyed Per Man-Day
						Rides	Man-Days	
Wisconsin								
1920-1944								
Region 1917-1944	Forest Service	27,506	65,507	1,665,457	30,161	73.6	0.46	161
	Indian Service	26,573	53,141	19,228,062	57,960	361.8	1.08	332
	Non-Federal Public	63,100	177,624	10,942,497	45,284	61.6	0.25	242
	Private	194,443	729,099	30,003,643	215,442	60.6	0.30	251
Total Wisconsin								
1,255,222								
Region 1917-1944	Forest Service	119,736	290,310	19,522,797	95,858	67.2	0.33	204
	Indian Service	44,925	82,827	28,049,083	73,628	330.6	0.39	280
	National Park Service	15	120	13	-	0.1	-	-
	Non-Federal Public	245,404	733,946	44,545,398	186,488	61.1	0.26	239
Total Region								
1,910,948								
Total Wisconsin, 1917-1944								
3,166,170								
Illinois								
1936-1944								
Region	Non-Federal Public	1,903	7,104	560,537	2,150	79.9	0.50	261
	Private	331	2,523	15,459	320	17.8	0.13	142
Total Illinois								
2,483								
Region	Non-Federal Public	909	4,977	16,909	309	3.4	0.24	91
	Private	937	1,010	4,504	672	14.6	0.22	66
Total Illinois								
5,481								
Total Illinois, 1936-1944								
Region	Indian Service	10	206	7,932	57	17.4	0.28	63
	Non-Federal Public	226	3,310	16,468	1,519	140.8	1.16	121
Total Region								
2,117								
Total Illinois, 1936-1944								
7,598								

